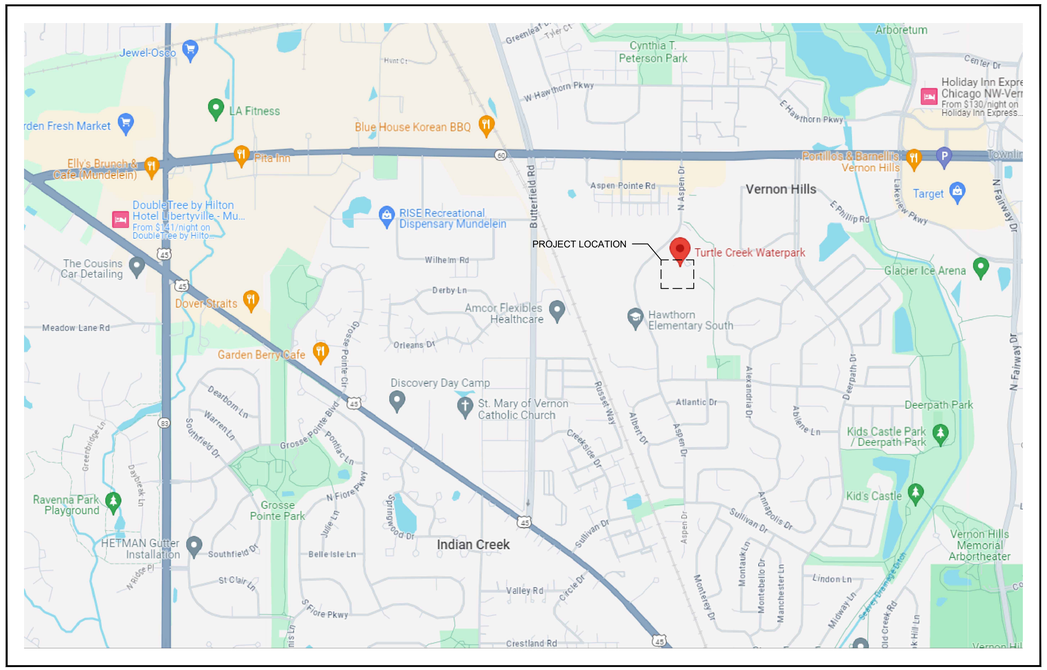
# TURTLE CREEK WATERPARK FILTER RENOVATION

## 635 N. ASPEN DRIVE.
## VERNON HILLS, IL 60061

LOCATION MAP




DRAWING INDEX



LICENSED PROFESSIONAL ENGINEER
MARK O. VENTRELLI
062-050025
OF ILLINOIS

EXPIRES 11/30/25 SIGNED 09/18/24

MARK O. VENTRELLI, P.E. # 062-050025

MY SEAL AND SIGNATURE SHALL ENCOMPASS DRAWINGS AQ0.0 THRU AQ3.3.

AQUATIC \ CIVIL \ MECHANICAL \ ELECTRICAL \ PLUMBING \ TELECOMMUNICATION \ STRUCTURAL \ ACCESSIBILITY CONSULTING \ DESIGN & PROGRAM MANAGEMENT \ LAND SURVEY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TURTLE CREEK WATER PARK - FILTER RENOVATION
635 N. ASPEN DRIVE
VERNON HILLS, IL 60061
**VERNON HILLS PARK DISTRICT**

ISSUE

| TO | DATE |
|---|---|
| BID SET | 09/18/24 |

CHECK: BZ
DRAWN: CS
JOB: A2400008

**AQ0.0**
COVER SHEET

# SPECIFICATION

SECTION 22 51 00 - FILTRATION PLUMBING SYSTEM

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. FILTRATION RECIRCULATION PIPING

B. FILTER

C. FILTRATION PUMPS

D. FILTRATION WATER TREATMENT EQUIPMENT.

E. MISCELLANEOUS POOL TESTING, SAFETY AND CONTROL EQUIPMENT AS REQUIRED BY THE DEPARTMENT OF PUBLIC HEALTH.

F. FILTRATION START-UP, CLOSING, AND INSTRUCTION OF OWNERS PERSONNEL.

1.02 RELATED SECTIONS

A. DIVISION 1 - PROJECT MANAGEMENT AND COORDINATION: MECHANICAL AND ELECTRICAL WORK COORDINATION.

B. DIVISION 22 - PLUMBING SYSTEMS: POTABLE WATER OR FRESH WATER CONNECTION TO FILL PIPES (SEE CONTRACT DOCUMENTS) AND WASTE WATER CONNECTION FROM FILTER AS SHOWN ON DRAWINGS.

C. DIVISION 26 - ELECTRICAL GENERAL PROVISION: POOL ELECTRICAL WORK, ALL ELECTRICAL CONNECTIONS SHALL BE BY THE ELECTRICAL SUB-CONTRACTOR. THE POOL SUB-CONTRACTOR SHALL PROVIDE THE FILTER PUMPS, MOTORS, VARIABLE FREQUENCY DRIVES, SOLENOIDS, RELAYS, WATER LEVEL PROBES (WITH HOUSING), MOTORIZED VALVES, ETC. THE ELECTRICAL SUB-CONTRACTOR SHALL INSTALL AND WIRE ALL ELECTRICAL EQUIPMENT FURNISHED BY THE POOL SUB-CONTRACTOR AND SHALL PROVIDE ALL MOTOR STARTERS AND DISCONNECT SWITCHES AS INDICATED OR REQUIRED BY CODES. THE ELECTRICAL SUB-CONTRACTOR SHALL PROVIDE BONDING PER NEC ARTICLE 680.

1.03 REFERENCES

A. ASTM B88 - SPECIFICATION FOR SEAMLESS COPPER WATER TUBE.

B. ASTM D1785 - SPECIFICATION FOR STANDARD SPECIFICATION POLYVINYL CHLORIDE (PVC) PLASTIC PIPE SCHEDULES 40, 80, AND 120.

C. ASTM D1784 - SPECIFICATION FOR RIGID POLY VINYL CHLORIDE (PVC) COMPOUNDS AND CHLORINATED POLY VINYL CHLORIDE (CPVC) COMPOUNDS.

D. ASTM D2564 - SPECIFICATIONS FOR SOLVENT CEMENTS FOR POLY VINYL CHLORIDE (PVC) PLASTIC PIPE AND FITTINGS.

E. ASTM D2855 - PRACTICE FOR MAKING SOLVENT-CEMENTED JOINTS WITH PVC PIPE AND FITTINGS.

F. NSF - SEAL FOR POTABLE WATER.

1.04 DEFINITIONS

A. THE TERM "POOL" AS USED IN THIS SECTION SHALL REFER TO THE FILTRATION SYSTEM.

B. THE TERM "AQUATIC ENGINEER" AS USED IN THIS SECTION SHALL REFER TO THE POOL DESIGN ONLY.

1.05 SYSTEM DESCRIPTION

A. PROVIDE ALL LABOR AND MATERIALS NECESSARY FOR CONSTRUCTION OF THE NEW POOL ADDITION. THE ABOVE WILL BE COMPLETE WILL ALL EQUIPMENT AS INDICATED ON THE CONSTRUCTION DOCUMENTS. CONSTRUCTION SHALL BE IN ACCORDANCE WITH STATE AND LOCAL CODES.

1.06 SUBMITTALS

A. SUBMIT UNDER PROVISIONS OF DIVISION 1.

B. PRODUCT DATA: PROVIDE MANUFACTURER'S / INSTALLER'S WRITTEN INSTALLATIO INSTRUCTIONS.

C. THE CONTRACTOR SHALL SUBMIT FOR APPROVAL TO THE ARCHITECT / ENGINEER COMPLETE LISTS, INCLUDING DESCRIPTIONS CATALOG CUTS, ETC., AND WHERE APPLICABLE DIMENSIONED SHOP DRAWINGS OF ALL MATERIAL, FIXTURES AND EQUIPMENT TO BE FURNISHED AND INSTALLED UNDER THIS SPECIFICATION. SUBMITTAL SHALL ADEQUATELY AND COMPLETELY DESCRIBE THE EQUIPMENT, INCLUDING WHERE NECESSARY OR REQUESTED COMPLETE CONSTRUCTION AND INSTALLATION DIMENSIONS, COMPLETE CAPACITY AND PERFORMANCE DATA, ALL ACCESSORY AND AUXILIARY EQUIPMENT, AND ALL PERTINENT DETAILS OF MANUFACTURE. SHOP DRAWINGS FOR EQUIPMENT SHALL BE SUBMITTED AND APPROVAL OF SHOP DRAWINGS SHALL BE OBTAINED BEFORE PROCEEDING WITH FABRICATION. SHOP DRAWINGS SHALL NOT BE "DOCTORED" REPRODUCIBLES OF ARCHITECTS / ENGINEERS DRAWINGS.

D. OPERATION AND MAINTENANCE MANUALS: SUBMIT 4 COPIES IN ACCORDANCE WITH THE REQUIREMENTS IN DIVISION 1.

E. REQUIRED SUBMITTALS:

1. FILTER, PUMPS AND ACCESSORY EQUIPMENT
2. VALVES
3. PIPING MATERIALS
4. LINK SEALS FOR PIPING
5. GUARANTEES WARRANTEES:
   a. STANDARD ONE (1) YEAR
7. CLOSE OUT DOCUMENTS:
   a. O&M MANUALS
   b. AS BUILT DRAWINGS
   c. OWNERS CERTIFICATION OF INSTRUCTION

1.07 QUALITY ASSURANCE

A. QUALIFICATIONS OF POOL SUB-CONTRACTOR/EQUIPMENT SUPPLIER: WORK OF THIS SECTION SHALL BE PERFORMED BY A CONTRACTOR WHO HAS A PROVEN RECORD OF COMPETENCE AND EXPERIENCE IN THE CONSTRUCTION OF SIMILAR FACILITIES OF THIS SIZE AND COMPLEXITY FOR NOT LESS THAN 5 YEARS. REFERENCES WILL BE REQUIRED BY THE OWNER. CONTRACTOR MUST BE PREQUALIFIED BY THE ILLINOIS DEPT. OF PUBLIC HEALTH.

B. PERFORMANCE CRITERIA: CERTAIN SECTIONS OF THE SPECIFICATIONS CONTAIN PERFORMANCE CRITERIA RATHER THAN PRODUCT DESCRIPTIONS. IT SHALL BE THE OBLIGATION OF THE CONTRACTOR / EQUIPMENT SUPPLIER TO INSURE THAT ALL CRITERIA ARE SATISFIED AND THE BURDEN OR PROOF OF CONFORMANCE SHALL REST WITH THE CONTRACTOR/EQUIPMENT SUPPLIER. THE AQUATIC ENGINEER SHALL REQUIRE COMPLETE CALCULATIONS, PAST PERFORMANCE RECORDS AND, IF REQUIRED, INSPECTION TRIPS OF SIMILAR FACILITIES TO SUBSTANTIATE CONFORMANCE WITH THESE CRITERIA. THE AQUATIC ENGINEER SHALL BE SOLE JUDGE OF CONFORMANCE. THE POOL SUB-CONTRACTOR / EQUIPMENT SUPPLIER IS CAUTIONED THAT HE WILL BE REQUIRED TO PROVIDE A FINISHED PRODUCT MEETING ALL STATED CRITERIA AND MEETING OR EXCEEDING DEPARTMENT OF HEALTH REQUIREMENTS.

1.08 REGULATORY REQUIREMENTS

A. ALL APPLICABLE LOCAL BUILDING AND HEALTH CODES.

B. NATIONAL ELECTRICAL CODE (NEC)

C. NATIONAL SANITATION FOUNDATION (NSF): SEAL OF APPROVAL PROGRAM.

D. DEPARTMENT OF PUBLIC HEALTH SWIMMING POOL CODE

E. ASME CODE AND LABEL.

1.09 REQUIRED PERMITS

A. DEPARTMENT OF PUBLIC HEALTH BY AQUATIC ENGINEER/OWNER.

B. COUNTY AND LOCAL DEPARTMENTS OF PUBLIC HEALTH BY POOL CONTRACTOR/OWNER.

1.10 DELIVERY, STORAGE AND HANDLING

A. DELIVER, STORE, PROTECT AND HANDLE PRODUCTS TO SITE UNDER PROVISIONS OF SPECIFICATIONS.

B. DELIVER ALL MATERIALS AND EQUIPMENT TO THE WORK SITE IN ORIGINAL PACKAGES FULLY IDENTIFIED, WITH MANUFACTURER'S LABEL. STORE OFF GROUND AND PROTECT FROM WEATHER WITH A SUITABLE COVERING.

C. PROTECT PLASTIC PIPE FROM EXPOSURE TO CHEMICALS (AROMATIC HYDROCARBONS, HALOGENATED HYDROCARBONS AND OTHER ESTERS AND KETONES) THAT MIGHT ATTACK THE MATERIAL. PROTECT ALL PIPE FROM MECHANICAL DAMAGE AND LONG EXPOSURE TO SUNLIGHT DURING STORAGE.

1.11 WARRANTY

A. WARRANTY: PROVIDE ONE (1) YEAR WARRANTY COVERING ALL POOL WORKMANSHIP, MATERIALS AND EQUIPMENT.

B. ALL STANDARD MANUFACTURER'S WARRANTIES SHALL APPLY TO ALL EQUIPMENT AND PRODUCTS PROVIDED BY THIS SUBCONTRACTOR.

PART 2 - PRODUCTS

2.01 FILTRATION SYSTEM

A. SUMMARY

1. THE WORK INCLUDES: FURNISHING AND INSTALLING PRESSURE SAND POOL FILTER, PIPING, VALVES, GAUGES, PUMPS, MOTORS, AND CHEMICAL FEED EQUIPMENT COMPLETE AND READY FOR USE; TESTING; AND ALL RELATED WORK THERETO AS SHOWN, SPECIFIED AND/OR NECESSARY FOR THE PROPER COMPLETION OF THE WORK UNDER THIS CONTRACT.

2. ALL MATERIAL AND WORKMANSHIP PERTAINING TO THE CONTRACT SHALL BE IN ACCORDANCE WITH THESE SPECIFICATIONS AND ALL APPURTENANT DOCUMENTS, EACH TO BE CONSIDERED AS SUPPLEMENTING AND ILLUSTRATING THE OTHER. THE WORKMANSHIP ON ALL EQUIPMENT FURNISHED SHALL BE IN ACCORDANCE WITH THE BEST PRACTICES IN MODEM MANUFACTURING AND ALL PARTS AND ACCESSORIES SHALL FIT AND OPERATE PROPERLY.

3. THE EQUIPMENT DESCRIBED HEREIN SHALL HAVE STANDARD NEW PARTS AND ACCESSORIES

# SPECIFICATION

B. GENERAL REQUIREMENTS

1. CONTRACTOR IS ADVISED THAT THE DESCRIPTION, CATALOG NUMBERS AND MANUFACTURER'S NAMES OF CERTAIN PIPES AND EQUIPMENT ACCESSORIES LISTED ON DRAWINGS, ARE NOT REPEATED IN THE SPECIFICATION.

2. SHOP DRAWINGS: CONTRACTOR SHALL SUBMIT FOR EACH LOCATION, 1 ELECTRONIC SET AND 1 PAPER SET OF CATALOG CUTS FOR ALL EQUIPMENT, PRIOR TO INSTALLATION FOR APPROVAL.

3. PROJECT DRAWINGS ARE DIAGRAMMATIC AND SHOW THE GENERAL REQUIREMENTS AS TO SIZE OF PIPE, VALVES AND APPURTENANCES AND TO THE LOCATION OF FIXTURES. IF INSTALLED PIPING WILL INTERFERE WITH INSTALLATION OF OTHER WORK SHOWN, THE CONTRACTOR AT HIS OWN EXPENSE SHALL MAKE SUCH CHANGES AS DIRECTED.

4. LAWS AND ORDINANCES: THE PLUMBING WORK SHALL BE DONE IN STRICT ACCORDANCE WITH THE PLUMBING PROVISIONS OF THE ILLINOIS SWIMMIING POOL AND BATHING BEACH CODE. WHERE PLANS SHOW OR SPECIFICATIONS CALL FOR SIZES OF MATERIALS IN EXCESS OF THOSE REQUIRED BY CODE, THE PLANS SPECIFICATIONS SHALL GOVERN THE INSTALLATION.

5. SUBSTITUTES: CONTRACT IS BASED UPON FURNISHING MATERIALS AND EQUIPMENT STRICTLY IN ACCORDANCE WITH THE TYPE AND MAKES SHOWN AND/OR CALLED FOR IN THE SPECIFICATIONS. CONSIDERATION WILL BE GIVEN FOR SUBSTITUTION THAT WILL BE EQUAL TO IN EVERY RESPECT TO THOSE SPECIFIED AND/OR SHOWN.

6. COOPERATION: WORK HEREUNDER SHALL BE SCHEDULED, PLANNED EXECUTED SO AS NOT TO INTERFERE WITH OR DELAY ANY OTHER WORK UNDER THE CONTRACT.

7. CONTRACTOR SHALL MAKE ALL NECESSARY OPENINGS AND ALSO FURNISH AND INSTALL ALL PIPE AND FIXTURE SUPPORTS AND ANY OTHER FIXTURE DETAILS TO BE PLACED IN CONCRETE OR ANY OTHER PARTS OF THE STRUCTURE.

8. MATERIALS IN GENERAL: CONTRACTOR SHALL SUBMIT FOR APPROVAL SATISFACTORY EVIDENCE AS TO THE KIND AND QUALITY OF MATERIAL, AND/OR EQUIPMENT THAT HE PROPOSES TO USE IN THE WORK. SUCH EVIDENCE SHALL INCLUDE NAME OF MANUFACTURER, THE PERFORMANCE CAPACITY AND OTHER PERTINENT INFORMATION. IF INSTALLED WITHOUT THE REQUIRED APPROVAL, MATERIAL AND EQUIPMENT WILL BE SUBJECT TO SUBSEQUENT REJECTION. THE SPECIFIED REQUIREMENTS FOR MATERIALS SHALL BE CONSIDERED AS THE MINIMUM.

C. EQUIPMENT REQUIREMENTS

1. GENERAL: IT IS THE INTENT OF THESE SPECIFICATIONS TO DESCRIBE A COMPLETE FILTERING SYSTEM WITH ALL ACCESSORY ITEMS. WHERE A BRAND NAME IS MENTIONED, IT IS A QUALITY STANDARD AND THE WORDS "EQUAL TO" ARE IMPLIED. THE AQUATIC ENGINEER RESERVES THE RIGHT TO DEMAND THAT CONTRACTOR PROVIDE PROOF OF QUALITY AND PERFORMANCE WHERE THE BRAND NAME DIFFERS FROM THAT MENTIONED. IT IS FURTHER INTENT OF THESE SPECIFICATIONS THAT THE FILTRATION UNIT FROM EACH PUMP THROUGH THE BACKWASH SYSTEM, INCLUDING ALL FILTER CONTROL VALVES AS HEREINAFTER SPECIFIED, WITH ACCESSORIES BE SUPPLIED BY ONE COMPANY.

2. CODE REQUIREMENTS: HIGH RATE PRESSURE SAND FILTERS MUST CONFORM TO THE FOLLOWING CODE REQUIREMENTS:

   a. THE DESIGN FILTRATION RATE SHALL BE AS LISTED BY THE NATIONAL SANITATION FOUNDATION (NSF). THE BACKWASH RATE SHALL BE 15 GALLONS PER MINUTE PER SQUARE FOOT OF FILTER AREA.
   b. PRESSURE FILTERS SHALL HAVE PRESSURE GAUGES ON THE INLET AND OUTLET PIPING.
   c. PRESSURE FILTERS SHALL HAVE AN OBSERVABLE FREE FALL OR A SIGHT GLASS SHALL BE INSTALLED ON THE BACKWASH DISCHARGE LINE.
   d. PRESSURE FILTERS SHALL HAVE A MANUAL AIR-RELIEF VALVE AT THE HIGH POINT.

D. COMPONENTS

1. HIGH RATE PRESSURE SAND FILTERS:

   a. FILTERS SHALL BE NSF APPROVED. SUCH APPROVAL SHALL BE EVIDENCED BY THE FILTER MODEL NUMBER APPEARING IN THE CURRENT NSF TESTING LABORATORY LISTING FOR SWIMMING POOL FILTERS AS SUITABLE TO FILTER AT THE FLOW RATE REQUIRED FOR THIS PROJECT.
   b. FILTERS SHALL BE OF THE PRESSURE SAND TYPE, AS SHOWN. FILTERS SHALL BE THE PRODUCTS OF A MANUFACTURER REGULARLY ENGAGED IN THE FABRICATION OF SAND WATER FILTRATION EQUIPMENT AND WHO HAS A MINIMUM OF 3 YEARS EXPERIENCE IN THIS FIELD.
   c. IT IS NOT THE INTENTION OF THE SPECIFICATIONS TO LIMIT COMPETITION. THE PROPOSAL MUST BE ON FURNISHING THE EQUIPMENT AS SPECIFIED; HOWEVER, ANY BIDDER MAY, AT HIS OPTION, OFFER SUBSTITUTIONS FOR CONSIDERATION. IN PROPOSING SUBSTITUTIONS, BIDDER IS CAUTIONED TO REFER TO THE SPECIFICATIONS ONLY FOR QUALITY STANDARDS ON MATERIALS, QUANTITIES AND GENERAL OPERATION. ANY PROPOSED SUBSTITUTION SHALL INCLUDE A MECHANICAL LAYOUT INCORPORATING ALL REQUIRED CHANGE IN LAYOUT, PIPING AND VALVES. THE COST OF SUCH CHANGES SHALL BE INCLUDED IN THE PRICE OF THE SUBSTITUTE AND ANY SUCH PROPOSED SYSTEM MUST HAVE THE PRIOR APPROVAL OF STATE AND LOCAL HEALTH DEPARTMENTS.

E. GENERAL REQUIREMENTS:

1. THE FILTER SYSTEMS SHALL BE EQUAL TO PRESSURE SAND FILTERS AS MANUFACTURED BY PADDOCK AND APPROVED BY THE NATIONAL SANITATION FOUNDATION (NSF).

2. THE SYSTEM SHALL BE SUPPLIED COMPLETE BY THE MANUFACTURER AND SHALL INCLUDE: INTERNALS, CONTROL VALVE, GAUGE WITH PETCOCK, AIR RELEASE SYSTEM, BOTTOM DRAIN CONNECTION WITH STRAINER AND FILTER MEDIA, ETC., COMPLETE WITH ALL EQUIPMENT AND FITTINGS NECESSARY FOR THE SATISFACTORY OPERATION OF THE FILTER.

3. FILTER AREA REQUIRED SHALL BE AS SHOWN ON DRAWINGS.

2.02 WATER TREATMENT SYSTEM

A. PROVIDE A WATER TREATMENT SYSTEM AS SHOWN AND SCHEDULED ON CONTRACT DOCUMENTS. ALL IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

B. FURNISH OWNER WITH WRITTEN WATER TREATMENT PROGRAM COMPLETE WITH WRITTEN BASIC WATER CHEMICAL ANALYSIS AND VERBAL INSTRUCTIONS AS TO OPERATE OF SYSTEM.

C. PROVIDE A TEST KIT WITH SLIDE COMPARATOR, 0.5 - 10 PPM DPI, PH, ALKALINITY, HARDNESS, CYANURIC ACID AND BASE DEMAND. TEST KIT SHALL BE PROFESSIONAL COMPLETE TEST KIT AS MANUFACTURED BY TAYLOR, OR APPROVED EQUAL.

2.03 PUMPS [SELF PRIMING]

A. FILTRATION PUMPS

1. FURNISH AND INSTALL FILTRATION PUMPS AS MANUFACTURED BY PENTAIR, STA-RITE OR APPROVED EQUAL. SEE CONSTRUCTION DRAWINGS FOR HORSEPOWER, VOLTAGE, FLOW RATE AND SIZE.

2. PUMP SHALL BE CUSTOM MOLDED IN NORYL ETX AND FITTED WITH AN INTEGRAL STRAINER OF SAME MATERIAL.

B. MOTORS

1. MOTOR SHALL BE TOTALLY ENCLOSED, FAN COOLED WITH NON HYGROSCOPIC INSULATION, SERVICE FACTOR 1.15, INSULATION CLASS F, BALL-BEARING TYPE, OF AMPLE SIZE TO OPERATE ITS UNIT AT ITS PROPER FULL LOAD AN SPEED, DESIGNED FOR CONTINUOUS OPERATION AND SHALL BE EQUAL TO GENERAL ELECTRIC, WESTINGHOUSE OR ALLIS-CHALMERS.

2. ALL MOTORS SHALL BE 3-PHASE, 460/208-230 VOLTS AS REQUIRED, 60 HZ. ALL MOTORS REQUIRE A MOTOR STARTER WITH CURRENT INTERRUPTER OVERLOAD PROTECTION. ALL MOTORS REQUIRE A DISCONNECT SWITCH.

3. COMBINATION MOTOR STARTERS, ON GREATER THAN ¾ HP MOTORS SHALL HAVE HAND-OFF-AUTO SWITCH WITH PILOT LIGHT, AS REQUIRED. THE SWITCH SHALL BE PROVIDED WITH POSITIVE OVERLOAD HEATER COIL. STARTER SHALL BE EQUAL TO FURNAS, SCHNEIDER ELECTRIC OR WESTINGHOUSE, AS APPROVED. STARTERS AND MOTORS SHALL BE COMPATIBLE WITH EACH OTHER.

4. GROUND FAULT CIRCUIT INTERRUPTER (GFCI) SHALL BE USED ON CIRCUITS SUPPLYING POWER TO SWIMMING POOL EQUIPMENT.

# SPECIFICATION

2.04 POOL VALVES AND PIPING MATERIALS

A. PRODUCTS:

1. PROVIDE VALVES OF SAME MANUFACTURER THROUGHOUT WHERE POSSIBLE AND PRACTICAL.

2. PROVIDE VALVES WITH MANUFACTURER'S NAME AND PRESSURE RATING CLEARLY MARKED ON OUTSIDE OF BODY.

3. VALVE CONNECTIONS: PROVIDE VALVES SUITABLE TO CONNECT TO ADJOINING PIPING AS SPECIFIED FOR PIPE JOINT. USE PIPE SIZE VALVES.

B. USE VALVES:

1. PIPE SIZES 3" - 12", BUTTERFLY.

2. MISCELLANEOUS VALVES ½" - 2", PVC TRUE UNION BALL VALVES.

3. ALL CHEMICAL LINES AND EQUIPMENT - PVC TRUE UNION BALL VALVES.

C. BUTTERFLY VALVES:

1. BUTTERFLY VALVES 3" - 12" SHALL BE WAFER OR LUG BODIES AND SHALL BE SUITABLE FOR USE BETWEEN ANSI 125 OR 150 LB. FLANGES.

D. BODIES OF THE FLANGELESS DESIGN SHALL BE PROVIDED WITH AT LEAST FOUR (2) BOLT GUIDES TO CENTER THE VALVE IN THE PIPELINE.

E. ALL BUTTERFLY VALVES SHALL HAVE A CAST IRON BODY EPOXY COATED, DUCTILE IRON NYLON 11 COATED DISC, STAINLESS SHAFT WITH BUNA-N OR EPDM SEAT MINIMUM 150 PSI RATING.

1. ALL BUTTERFLY VALVES 3" - 6" SHALL HAVE 10 POSITION LOCKING HANDLE, BUTTERFLY VALVES 8" - 12" SHALL HAVE GEAR OPERATORS AND CHAIN OPERATORS AS REQUIRED.

2. ALL VALVES SHALL BE AS MANUFACTURED BY BRAY VALVE (713) 894 5454 OR EQUAL AS APPROVED BY THE AQUATIC ENGINEER.

F. BALL VALVES:

1. PVC TRUE UNION BALL VALVES, DUAL UNION, ASSAHI, OR EQUAL.

G. CHECK VALVES - (WHERE REQUIRED): SHALL BE STAINLESS STEEL, STAINLESS STEEL SPRING TRIM, BRONZE SPLIT DISC, SEAL MATERIAL BUNA-N. (CHEXX) MODEL AS MANUFACTURED BY TITAN OR GEORGE FISHER AS INDICATED ON CONTRACT DOCUMENTS.

H. SUBMERGED SERVICE OPERATORS: USE ONLY APPROVED SERVICE OPERATORS FOR THE VALVES REQUIRING UNDERWATER OPERATION IN THE SURGE TANK OR IN MANHOLE USED FOR POOL DRAINING.

I. VALVE OPERATOR EXTENSION: PROVIDE EXTENSION LENGTHS AS NECESSARY TO OPERATE SUBMERGED OR BELOW SURFACE VALVES AND THE APPROPRIATE VALVE BOX ACCESS COVER. EXTENSIONS SHALL BE BY SAME MANUFACTURER AS VALVE MANUFACTURER.

PART 3 - EXECUTION

3.01 PIPING AND PIPE FITTING - HANGERS AND SUPPORTS

A. WORK INCLUDED: PIPE, FITTINGS, CONNECTIONS, WALL PENETRATIONS, HANGERS AND SUPPORTS, EQUIPMENT BASES AND SUPPORTS, EXCAVATION AND BACKFILL.

B. USE THE PRESCRIBED PIPE TYPE IN THE FOLLOWING AREAS. ALL PLASTIC PIPE FLANGES SHALL BE SCHEDULED 80 PVC WITH NEOPRENE GASKETS WHERE REQUIRED.

1. ALL PIPING SHALL BE SCHEDULE 80 PVC SOLVENT WELD, CONFORMING TO ASTM D1785/76 OR ASTM D1784.

2. ALL HEATER INFLUENT AND EFFLUENT PIPING SHALL BE SCHEDULE 80 CPVC SOLVENT WELD CONFORMING TO ASTM D1785.

3. ALL BURIED FILTER RETURN LINES, MAIN DRAIN LINES PVC SCHEDULE 80, SOLVENT WELD.

4. ALL ABOVE GRADE PIPING INSIDE THE PUMP MECHANICAL ROOM, SCHEDULE 80 PVC, SOLVENT WELD, EXCEPT WHERE NOTED OTHERWISE.

C. HANGERS AND SUPPORTS: SUBMIT HANGER LOCATIONS AND WEIGHTS, HANGER DETAILS ON SHOP DRAWINGS.

1. ALL MECHANICAL ROOM PIPING MUST BE PROPERLY SUPPORTED PER STANDARD PRACTICES.

2. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PROPERLY SUPPORT PIPING AT ALL VALVES, PUMPS, EQUIPMENT, OVERHEAD AREAS, ETC.

3. ALL PIPING MUST BE SUPPORTED LATERALLY AS WELL AS VERTICALLY HUNG. ALL HANGERS TO HOT DIPPED GALVANIZED.

4. ALL PIPING CONNECTIONS AND SUPPORT HARDWARE SHALL BE STAINLESS STEEL INSIDE RESERVOIR.

D. POOL PIPE EXCAVATION AND BACKFILL:

1. EXCAVATION FOR ALL SPRAY POOL SYSTEM RELATED PIPING.

   a. COMPLY WITH "STANDARD SPECIFICATIONS"

2. SPECIAL BACKFILL AND BEDDING MATERIALS

   a. EXISTING SUBSOIL MATERIALS SHALL NOT BE USED FOR PIPE BEDDING.
   b. ALL PIPING SHALL BE BEDDED WITH A MINIMUM OF 6" CLEAN STONE MATERIAL AND A MINIMUM OF 2'-0" CLEAN STONE MATERIAL TOP COVER. THE BALANCE MAY BE EXISTING SITE MATERIAL, PROVIDED NO ORGANIC MATERIAL OR CLAY IS USED.
   c. PIPING SHALL BE COVERED WITH 6" LIFTS OF GRANULAR FILL AND COMPACTED ACCORDING TO SPECIFICATIONS.

E. PIPING:

1. PIPING MUST BE LAID ON A GRADE SO IT WILL COMPLETELY DRAIN BY GRAVITY.

2. CUT ALL PIPE WITH MECHANICAL CUTTER WITHOUT DAMAGE TO PIPE.

3. PLACING AND LAYING: INSPECT PIPE FOR DEFECTS BEFORE INSTALLATION. CLEAN THE INTERIOR OF PIPE THOROUGHLY OF FOREIGN MATTER AND KEEP CLEAN DURING LAYING OPERATION. PIPE SHALL NOT BE LAID IN WATER OR WHEN TRENCH CONDITIONS ARE UNSTABLE. WATER SHALL BE KEPT OUT OF THE TRENCH UNTIL THE PIPE IS INSTALLED. WHEN WORK IS NOT IN PROGRESS, OPEN ENDS OF PIPE AND FITTINGS SHALL BE SECURELY CLOSED SO THAT NO TRENCH WATER, EARTH OR OTHER SUBSTANCE WILL ENTER THE PIPES OR FITTINGS.

4. THREADED JOINTS: AFTER CUTTING AND BEFORE THREADING, THE PIPE SHALL BE REAMED AND SHALL HAVE BURRS REMOVED. SCREW JOINTS SHALL BE MADE WITH GRAPHITE OR INERT FILLER AND OIL OR WITH AN APPROVED GRAPHITE COMPOUND APPLIED TO MAKE THREADS ONLY. THREADS SHALL BE FULL-CUT AND NOT MORE THAN 3 THREADS ON THE PIPE REMAINED EXPOSED. USE TEFLON II TAPE ON THE MAKE THREADS OF ALL THREADED PIPE JOINTS. CAULKING OF THREADED JOINTS TO STOP OR PREVENT LEAKS WILL NOT BE PERMITTED. UNIONS SHALL BE PROVIDED WHERE REQUIRED FOR DISCONNECTION OF EXPOSED PIPING. UNIONS WILL BE PERMITTED WHERE ACCESS IS PROVIDED.

5. SOLVENT WELDED JOINTS SHALL BE MADE IN ACCORDANCE WITH THE MANUFACTURER'S PRINTED INSTRUCTIONS AND THE FOLLOWING MINIMUM STANDARDS:

   a. ALL FITTINGS SHALL FIT EASILY ON THE PIPE BEFORE APPLYING CEMENT. THE OUTER SURFACE AREA OF PIPE AND INNER WALL OF FITTING SHALL BE DRY AND CLEAN. CLEANER IS TO BE APPLIED TO THE OUTER SURFACE OF THE PIPE AND TO THE INNER SURFACE OF THE FITTING. CEMENT IS TO BE APPLIED TO THE OUTER SURFACE OF THE PIPE, OR ON THE MALE SECTION OF FITTINGS ONLY. WHEN THE OUTSIDE SURFACE AREA OF THE PIPE IS SATISFACTORILY COVERED WITH CEMENT ALLOW TEN (10) SECONDS OPEN TIME TO LAPSE BEFORE INSERTING PIPE END INTO FITTINGS. AFTER FULL INSERTION OF PIPE INTO FITTING, TURN FITTING AROUND THE PIPE END APPROX. 1/8 TO ¼ OF A TURN. WIPE OFF EXCESS CEMENT AT THE JOINT IN A NEAT COVE BEAD. FOLLOW MANUFACTURER'S INSTRUCTIONS ON SOLVENTS.
   b. ALL JOINTS SHALL REMAIN COMPLETELY UNDISTURBED FOR A MINIMUM OF 10 MINUTES FROM TIME OF JOINTING THE PIPE AND FITTING. IF NECESSARY TO APPLY PRESSURE TO A NEWLY MADE JOINT, LIMIT TO 10% OF RATED PIPE PRESSURE, DURING THE FIRST 24 HOURS AFTER THE JOINT HAS BEEN MADE.
   c. FULL WORKING PRESSURE SHALL NOT BE APPLIED UNTIL THE JOINTS HAVE SET FOR A PERIOD OF 24 HOURS.

6. MAKE PROVISIONS FOR EXPANSION AND CONTRACTION BY WAY OF SWING JOINTS OR SNAKING.

F. PROTECT PLASTIC PIPE FROM EXPOSURE TO AROMATIC HYDROCARBONS, HALOGENATED HYDRO-CARBONS, AND MOST OF THE ESTERS AND KEOTONES THAT ATTACK THE MATERIAL. PROTECT ALL PIPE FROM MECHANICAL DAMAGE AND LONG EXPOSURE TO SUNLIGHT DURING STORAGE.

G. NO INSTALLATION SHALL BE MADE THAT WILL PROVIDE A CROSS CONNECTION OR INTERCONNECTION BETWEEN DISTRIBUTION SUPPLY FOR DRINKING PURPOSES AND THE SWIMMING POOL THAT WILL PERMIT A BACKFLOW OF WATER INTO THE POTABLE WATER SUPPLY. PIPE OPENINGS SHALL BE CLOSED WITH CAPS OR PLUGS DURING INSTALLATION. EQUIPMENT AND POOL FITTINGS SHALL BE TIGHTLY COVERED AND PROTECTED AGAINST DIRT, WATER AND CHEMICAL OR MECHANICAL INJURY. AT THE COMPLETION OF WORK THE FITTINGS, MATERIALS AND EQUIPMENT SHALL BE THOROUGHLY CLEAN AND ADJUSTED FOR PROPER OPERATION.

# GENERAL NOTES

1. ILLINOIS SWIMMING POOL CODE APPLICABLE
2. ILLINOIS PLUMBING CODE APPLICABLE
3. NATIONAL ELECTRICAL CODE APPLICABLE - 2008 NEC
4. REFER TO EQUIPMENT LISTS ON SHEETS AQ0.2
5. REFER TO ELECTRICAL REQUIREMENTS ON SHEET AQ0.2
6. REFER TO PLUMBING NOTES ON SHEET AQ0.2

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TURTLE CREEK WATER PARK - FILTER RENOVATION
635 N. ASPEN DRIVE
VERNON HILLS, IL 60061
**VERNON HILLS PARK DISTRICT**

ISSUE

| TO | DATE |
|---|---|
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DRAWN: CS
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**AQ0.1**
SPECIFICATION

## SPECIFICATION

H. PIPE IDENTIFICATION

1. PROVIDE IDENTIFICATION ON ALL PIPING LOCATED IN MECHANICAL EQUIPMENT, CHLORINE, ACID ROOMS, HEATER COURTS, ETC.
2. IDENTIFY THE PIPE THAT THE LINE IS SERVING (CONTENTS & DIRECTION OF FLOW).
3. MARK AT LEAST ONCE ON EACH LINE AND AT 10 FT. INTERVALS ON LONG PIPE RUNS. CONSULT HEALTH DEPARTMENT CODE FORM MINIMUM MARKING REQUIREMENTS.
4. COLOR CODE PER HEALTH DEPARTMENT REQUIREMENTS. IF CODE DOES NOT IDENTIFY COLOR CODING REQUIREMENTS CONSULT AQUATIC ENGINEER.
5. BRADY, B-946, CUSTOM LEGEND, SELF-STICKING MARKERS AND ARROWS OR EQUAL.

3.02 EQUIPMENT BASES AND SUPPORTS

A. PROVIDE FOR MAJOR EQUIPMENT, REINFORCED CONCRETE HOUSEKEEPING BASES POURED DIRECTLY ON STRUCTURAL FLOOR SLABS (AS REQUIRED BY EQUIPMENT MANUFACTURER) 4 INCHES THICK MINIMUM; UNLESS NOTED OTHERWISE ON PLANS EXTENDED 4 INCHES MINIMUM BEYOND MACHINERY BED PLATES. PROVIDE TEMPLATES, ANCHOR BOLTS, RUBBER VIBRATION ISOLATORS AND ACCESSORIES REQUIRED FOR MOUNTING AND ANCHORING EQUIPMENT. ANCHORAGE SYSTEM SHALL BE IN ACCORDANCE WITH THE EQUIPMENT MANUFACTURER'S SPECIFICATIONS.

3.03 SLEEVES AND WALL PENETRATIONS

A. PIPES PENETRATING ALL WATER TIGHT WALLS SHALL USE "LINK SEAL" CENTURY LINE SLEEVES IN COMBINATION WITH LINK SEALS HAVING A TYPE 316 STAINLESS STEEL SERVICE DESIGNATION. PATCH EXTERIOR SIDE OF WALL PENETRATIONS WITH NON-SHRINK GROUT AS SPECIFIED IN SECTION 13150-3.1.Q.2.A. OTHER METHODS OF WATER TIGHTNESS SHALL BE PRE-APPROVED BY THE AQUATIC ENGINEER.

B. PROVIDE SHOP DRAWINGS ON PROPOSED LOCATIONS OF ALL PIPES PENETRATING WATER TIGHT WALLS. THESE SHOULD INDICATE HOW CONTRACTOR PROPOSES TO OPERATE AND WINTERIZE SYSTEM.

3.04 TESTING/FIELD QUALITY CONTROL

A. THIS SECTION REQUIRES THE FOLLOWING TESTS TO BE PERFORMED BY THE CONTRACTOR

B. TESTING AND FLUSHING OF PIPING:

1. CONTRACTOR SHALL BE RESPONSIBLE FOR DISCOVERING LEAKS AND MAKING NECESSARY REPAIRS.
2. AFTER THE PIECE IS LAID, THE JOINTS COMPLETED, AND THE TRENCH PARTIALLY BACKFILLED LEAVING JOINTS EXPOSED FOR EXAMINATION, TEST ALL POOL PIPING PER THE ILLINOIS PLUMBING CODE, SECTION 890.1930, TEST METHODS. JOINTS SHALL REMAIN AIRTIGHT UNDER THIS PRESSURE FOR A PERIOD OF TWELVE HOURS. PROVIDE TEST RESULTS TO THE AQUATIC ENGINEER BEFORE BACKFILLING PIPES OR COVERING PIPES WITH CONCRETE.
3. LEAKS SHALL BE REPAIRED AND TESTED REPEATEDLY UNTIL LEAKAGE OR INFILTRATION IS APPROVED

C. WATER TREATMENT:

1. OBTAIN A CHEMICAL ANALYSIS OF THE SOURCE/POOL MAKE-UP WATER SUPPLY AND SUBMIT TO AQUATIC ENGINEER. INCLUDE THE FOLLOWING:
   a. TOTAL ALKALINITY / PPM
   b. CALCIUM HARDNESS / PPM
   c. CHLORINE / PPM
   d. PH
   e. IRON
   f. COPPER
2. TREAT AND BALANCE POOL WATER PRIOR TO TURNOVER OF POOL TO THE OWNER (USING CHEMICALS PROVIDED BY THE OWNER).
3. POOL WATER: BALANCE TO ESTABLISH A TOTAL ALKALINITY LEVEL OF 60-125 PPM AND CALCIUM HARDNESS LEVEL OF 180-375 PPM (3 TIMES ALKALINITY LEVEL).
4. STABILIZE POOL WATER BY SHOCKING TO 20 PPM OF CHLORINE FOR INITIAL SANITATION.
5. CONSULT WITH AQUATIC ENGINEER FOR SPECIAL WATERS TO ESTABLISH BALANCED LEVELS.

3.05 INSTRUCTION OF OWNER'S PERSONNEL

A. THE POOL SUB-CONTRACTOR SHALL SUPPLY THE SERVICES OF AN EXPERIENCED SWIMMING POOL OPERATOR INSTRUCTOR FOR A PERIOD OF NOT LESS THAN FIVE DAYS (3 DAYS OPERATIONS, 1 DAY START-UP, 1 DAY WINTERIZING) AFTER THE POOL HAS BEEN FILLED AND INITIALLY PLACED IN OPERATION. DURING THIS PERIOD THE OWNER'S DESIGNATED REPRESENTATIVES SHALL BE THOROUGHLY INSTRUCTED IN ALL PHASES OF THE POOL'S OPERATION.

B. PRIOR TO THIS INSTRUCTOR LEAVING THE JOB, HE SHALL OBTAIN WRITTEN CERTIFICATION FROM THE OWNER'S DESIGNATED REPRESENTATIVE ACKNOWLEDGING THAT THE INSTRUCTION PERIOD HAS BEEN COMPLETED AND ALL NECESSARY OPERATING INFORMATION PROVIDED.

C. POOL SUB-CONTRACTOR SHALL DELIVER FOUR COMPLETE SETS OF OPERATING AND MAINTENANCE INSTRUCTIONS FOR THE SPRAY POOL STRUCTURES, FINISHES AND ALL COMPONENT EQUIPMENT TO THE AQUATIC ENGINEER. INCLUDING, BUT NOT LIMITED TO THE FOLLOWING:

1. BOUND TOGETHER IN A COMPLETE MANUAL.
2. ACCURATE PART'S LIST
3. POOL START-UP INSTRUCTIONS.
4. NARRATIVE ON THE POOL OPERATION THROUGH ALL SEQUENCES.
5. ALL VALVES MUST BE PERMANENTLY TAGGED ALONG WITH VALVE LEGEND AND EXPLANATION.
6. TROUBLE SHOOTING INFORMATION
7. A SCHEMATIC PIPING DIAGRAM AS INSTALLED.
8. ALL PIPING IN MECHANICAL ROOM TO BE LABELED WITH DESCRIPTION OF LINE AN ARROWS INDICATING DIRECTION OF FLOW
9. PROVIDE A VIDEO OF COMPLETE START-UP AND SHUT DOWN OPERATIONS.

3.06 CLEAN UP AND PROTECTION

A. AFTER WORK OF THIS SECTION HAS BEEN COMPLETED, CLEAN UP WORK AREAS AND REMOVE ALL EQUIPMENT EXCESS MATERIALS AND DEBRIS. PROTECT POOL FROM DAMAGE UNTIL TIME OF FINAL ACCEPTANCE. REMOVE AND REPLACE FINISHED WHICH ARE CHIPPED, CRACKED, ABRADED, IMPROPERLY ADHERED, OR OTHERWISE DAMAGED.

## PLUMBING NOTES

1. ALL PLUMBING WORK, THROUGHOUT THE ENTIRE SWIMMING POOL PROJECT, SHALL COMPLY AND BE IN ACCORDANCE WITH THE ILLINOIS STATE PLUMBING CODE.
2. PIPE MATERIALS FOR ALL POOL RECIRCULATION LINES TO BE, AS PER PLAN, SCHEDULE 80 PVC(ASTM D1785), UNLESS OTHERWISE SPECIFIED. PVC PIPING SHALL BE STAMPED WITH N.S.F. SEAL OF APPROVAL.
3. ALL POOL WATER HEATER INFLUENT AND EFFLUENT LINES FROM THE BYPASS TO THE HEATER ARE TO BE CPVC.
4. EACH FLOWMETER SHALL BE LOCATED FIVE (5) STRAIGHT PIPE DIAMETERS UPSTREAM AND TEN (10) STRAIGHT PIPE DIAMETERS DOWNSTREAM FROM ANY VALVES, ELBOWS OR OTHER SOURCES OF TURBULENCE.
5. FILTER DRAIN SHALL BE PIPED TO SANITARY WITH A SIX (6) INCH FREE FALL AT THE POINT OF DISPOSAL, NO FILTER MEDIA SHALL BE DISCHARGED INTO THE SANITARY SEWER.
6. THESE DRAWINGS ARE INTENDED FOR SCHEMATIC USE ONLY. FINAL PIPE LOCATIONS TO BE FIELD VERIFIED WITH ALL OTHER TRADES BY POOL CONTRACTOR. REFER TO ARCHITECTURAL, MECHANICAL, ELECTRICAL, PLUMBING AND STRUCTURAL DRAWINGS AS REQUIRED.
7. EACH HIGH RATE SAND FILTER TO BE BACKWASHED AT A RATE OF 15 G.P.M. PER SQ. FT. OF FILTER AREA. REGENERATIVE MEDIA FILTERS TO BE DRAIN BY GRAVITY. BOTH FILTER TYPES SHALL BE PIPED TO SANITARY W/ A 6" FREE FALL AT POINT OF DISPOSAL.
8. A PRESSURE RELIEF VALVE WITH A MAXIMUM PRESSURE RATING OF 75 POUNDS PER SQUARE INCH AND HAVING A THERMAL CAPACITY AT LEAST EQUAL TO THE HEAT INPUT RATING OF THE HEATER SHALL BE INSTALLED ON THE HEATER EFFLUENT PIPE, WITH THE DISCHARGE PIPED TO WITHIN SIX (6) INCHES OF THE FLOOR.
9. ALL VALVES TWO (2) INCHES AND SMALLER TO BE TRUE UNION PVC BALL VALVES, UNLESS OTHERWISE SPECIFIED. ALL VALVES THREE (3) INCHES AND LARGER TO BE BUTTERFLY VALVES, UNLESS OTHERWISE SPECIFIED. ALL CHECK VALVES, 2" AND SMALLER TO BE TRUE UNION 2000 INDUSTRIAL BALL CHECK VALVES BY SPEARS MFG. COMPANY OR EQUAL.
10. POOL CONTRACTOR NOT RESPONSIBLE FOR PENETRATIONS THRU FIRE RATED WALLS, FLOORS OR ROOMS. PENETRATIONS TO BE FIRE RATED TO ORIGINAL SPECIFICATIONS BY OWNER.
11. ALL FLOW CELLS SHALL BE PROVIDED WITH A FLOW SWITCH WHICH WILL TURN OFF THE CHEMICAL METERING PUMPS AND CHLORINATORS WHEN THE FILTRATION PUMP(S) IS NOT IN OPERATION. INFLUENT AND EFFLUENT PIPING FOR THE FLOW SWITCH SHALL ORIGINATE FROM THE FILTERED WATER SUPPLY PIPE SO THE CHEMICAL METERING PUMPS DO NOT OPERATE DURING THE BACKWASH CYCLE AND SYSTEM SHUT-DOWN.
12. POOL CONTRACTOR TO MINIMIZE THE USE OF FITTINGS WHEREVER POSSIBLE.
13. SEE SPECIFICATION FOR ADDITIONAL POOL PLUMBING INSTALLATION REQUIREMENTS.
14. THERMOMETERS SHALL BE PROVIDED IN THE PIPING TO CHECK THE TEMPERATURE OF THE WATER RETURNING FROM THE POOL AND THE TEMPERATURE OF THE BLENDED WATER RETURNING TO THE POOL.
15. THE DESIGN OF THE WATER HEATING SYSTEM SHALL PREVENT THE INTRODUCTION OF WATER IN EXCESS OF 115° F. TO THE POOL.
16. COMBUSTION AND VENTILATION AIR SHALL BE PROVIDED FOR FUEL-BURNING WATER HEATERS AS REQUIRED BY THE HEATER MANUFACTURER.

## PLUNGE POOL / LAZY RIVER ELECTRICAL REQUIREMENTS

FILTRATION PUMP
- QUANTITY: 2
- 40 HORSEPOWER
- 480 VOLT, 3-PHASE
- PROVIDE STARTER / DISCONNECT
- INTERLOCK WITH CHEMICAL CONTROLLER
- INTERLOCK WITH HEATER

FLOW METER
- QUANTITY: 2
- 4 TO 20 mA OUTPUT
  CONNECT TO FILTRATION PUMP VARIABLE FREQUENCY DRIVE

HEATER
- QUANTITY: 1
- 10 AMPS MAXIMUM
- 120 VOLT, 1-PHASE, G.F.C.I. PROTECTED
- PROVIDE DISCONNECT
- INTERLOCK WITH FILTRATION PUMP

AQUASTAT
- QUANTITY: 2
- LOW VOLTAGE WIRING TO POOL HEATER

VARIABLE FREQUENCY DRIVE
- QUANTITY: 2
- HARD WIRE TO PUMP MOTOR
- VOLTAGE AND HORSEPOWER TO MATCH ASSOCIATED PUMP MOTOR

## PLUNGE POOL / LAZY RIVER EQUIPMENT LIST (X)

A. FILTER
- QUANTITY: 2
- MANUFACTURER: PADDOCK
- MODEL#: VERTICEL 6734-V-2C
- HI-RATE SAND FILTER MEDIA
- FILTER SURFACE AREA: 113.5 SQ.FT.
- FILTRATION RATE PER SQ.FT.: 11.0 G.P.M.
- DUAL CELL SINGLE TANK
- PROVIDE SINGLE-LEVER LINKAGE

B. FILTRATION PUMP
- QUANTITY: 2
- MANUFACTURER: AURORA
- MODEL#: 3801-5x6x11
- FLOODED SUCTION
- EPOXY COATED CAST IRON
- 316SS IMPELLER
- FILTRATION FLOW RATE: 1,250 G.P.M.
- TOTAL DYNAMIC HEAD: 75'
- 40 HORSEPOWER
- 480 VOLT, 3-PHASE

C. VACUUM/ PRESSURE GAUGE
- QUANTITY: 2
- MANUFACTURER: TRERICE
- MODEL#: 700-LFSS
- 2 1/2" DIAL
- 0"-30" Hg / 0-60 P.S.I. RANGE

D. PRESSURE GAUGE
- QUANTITY: 4
- MANUFACTURER: TRERICE
- MODEL#: 700-LFSS
- 2 1/2" DIAL
- 0-60 P.S.I. RANGE

E. FLOW METER **(EXISTING)**
- QUANTITY: 2
- MANUFACTURER: GF SIGNET
- MODEL#: 3-2551-P2-12
- CONNECT TO VARIABLE FREQUENCY DRIVE
- 10" PIPE SIZE
- 4 TO 20 mA OUTPUT

F. HEATER
- QUANTITY: 1
- MANUFACTURER: LAARS
- MODEL#: MIGHTY THERM AP 2200 E
- NATURAL GAS
- 2,205,000 B.T.U. INPUT
- CUPRO-NICKEL HEAT EXCHANGER
- AUTOMATIC HIGH-LIMIT SHUT-OFF
- ASME PRESSURE RELIEF VALVE
- ASME CODE AND LABEL

G. THERMOMETER
- QUANTITY: 4
- MANUFACTURER: LETRO
- MODEL#: SL-1
- 30 DEGREE TO 130 DEGREE RANGE
- 1 DEGREE GRADATION

H. AQUASTAT **(EXISTING)**
- QUANTITY: 2
- MANUFACTURER: HONEYWELL
- MODEL#: L4006A1959
- 115 DEGREES FAHRENHEIT MAXIMUM

J. VARIABLE FREQUENCY DRIVE
- QUANTITY: 2
- MANUFACTURER: DAN FOSS
- MODEL#: FC102
- NEMA 12 ENCLOSURE
- DIGITAL READ-OUT FOR FLOW RATE
- INPUT DISCONNECT AND LINE REACTOR
- VOLTAGE AND HORSEPOWER TO MATCH ASSOCIATED PUMP MOTOR

K. CHLORINATOR **(EXISTING)**
- QUANTITY: 1
- MANUFACTURER: PULSAR
- MODEL#: PRECISION PS-1 HCE
- CALCIUM HYPOCHLORITE
- 192 LBS / DAY MAXIMUM OUTPUT
- 120 VOLT, 1-PHASE
- 1 H.P. BOOSTER PUMP

L. ACID METERING PUMP **(EXISTING)**
- QUANTITY: 1
- MANUFACTURER: STENNER
- MODEL#: 45M5
- MURIATIC ACID
- 2.5 TO 50 GPD OUTPUT
- 120 VOLT, 1-PHASE

## GENERAL NOTES

1. ILLINOIS SWIMMING POOL CODE APPLICABLE
2. ILLINOIS PLUMBING CODE APPLICABLE
3. NATIONAL ELECTRICAL CODE APPLICABLE - 2008 NEC
4. REFER TO EQUIPMENT LISTS ON SHEETS AQ0.2
5. REFER TO ELECTRICAL REQUIREMENTS ON SHEET AQ0.2
6. REFER TO PLUMBING NOTES ON SHEET AQ0.2

## PLUNGE POOL / LAZY RIVER DATA

| | |
|---|---|
| VOLUME | |
| LAZY RIVER ZERO DEPTH: | 9,600 GAL. |
| LAZY RIVER PLUNGE: | 10,440 GAL. |
| LAZY RIVER CHANNEL: | 218,991 GAL. |
| TOTAL LAZY RIVER VOLUME: (INCLUDING SURGE) | 239,031 GAL. |
| PLUNGE POOL VOLUME: | 19,865 GAL. |
| TOTAL VOLUME: | 258,896 GAL. |
| DESIGN FLOW RATE | |
| LAZY RIVER ZERO DEPTH: | 160 GPM |
| LAZY RIVER PLUNGE: | 174 GPM |
| LAZY RIVER CHANNEL: | 1,826 GPM |
| PLUNGE POOL: | 331 GPM |
| TOTAL FLOW RATE: | 2,491 GPM |
| TURNOVER RATE | |
| LAZY RIVER ZERO DEPTH: | 60 MINUTES |
| LAZY RIVER PLUNGE: | 60 MINUTES |
| LAZY RIVER CHANNEL: | 120 MINUTES |
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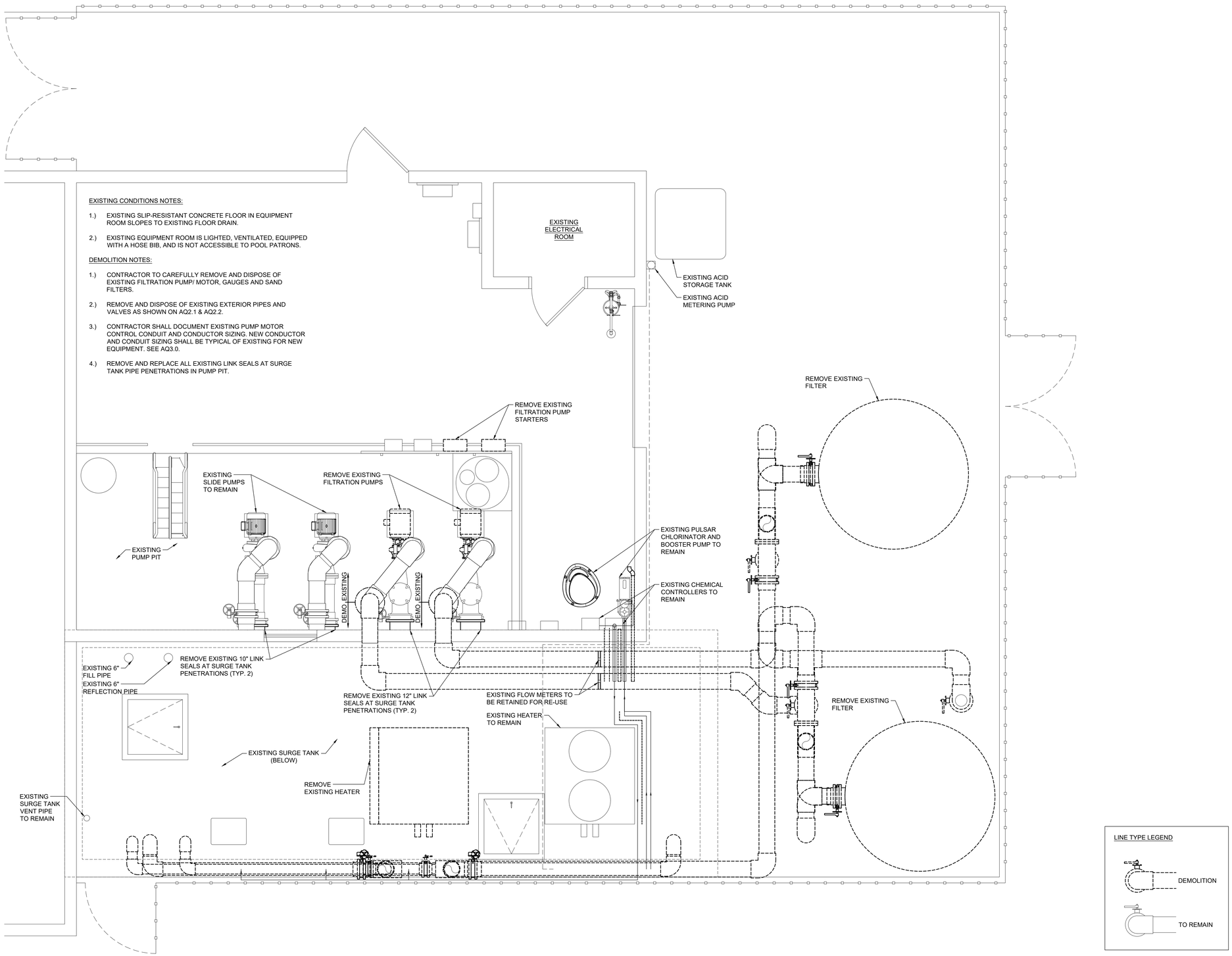
**AQ0.2**
SPECIFICATION, EQUIPMENT LIST AND REQUIREMENTS




1 DEMOLITION FILTER EQUIPMENT LAYOUT

SCALE: 3/8" = 1'-0"

## GENERAL NOTES

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| PLUNGE POOL: | 60 MINUTES |

## PLUNGE POOL / LAZY RIVER EQUIPMENT TAGS

(X)

A. FILTER
B. FILTRATION PUMP
C. VACUUM/ PRESSURE GAUGE
D. PRESSURE GAUGE
E. FLOW METER (EXISTING)
F. HEATER
G. THERMOMETER
H. AQUASTAT (EXISTING)
J. VARIABLE FREQUENCY DRIVE
K. CHLORINATOR (EXISTING)
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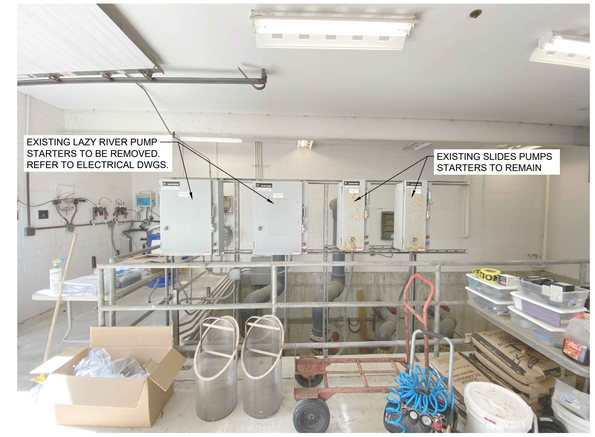
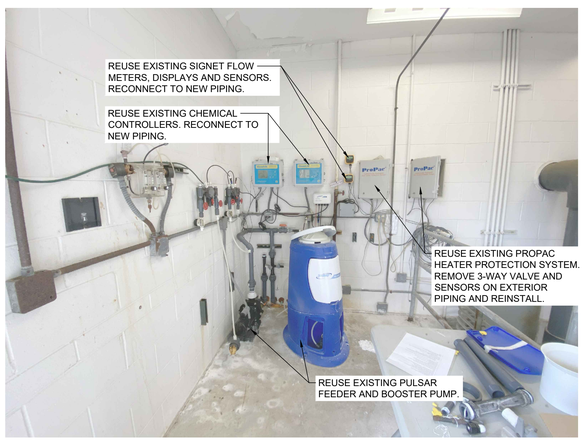
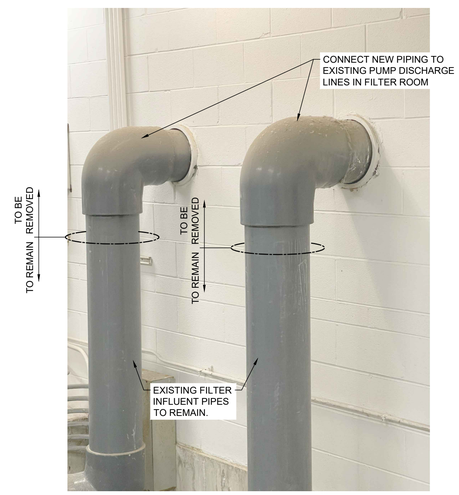
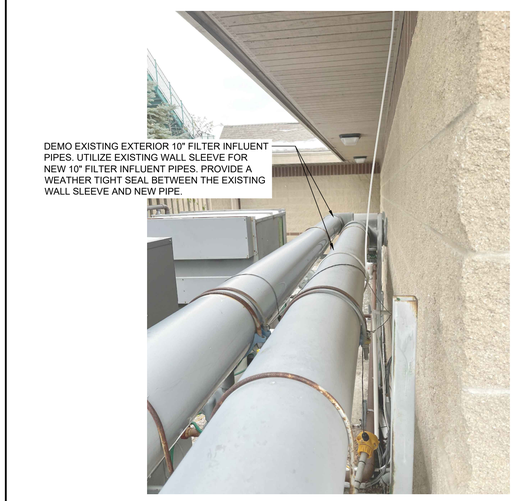
**AQ2.0**
DEMOLITION FILTER EQUIPMENT LAYOUT

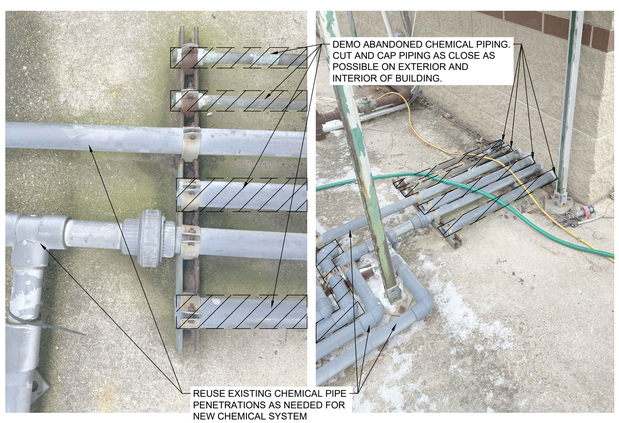







NOTE: CUT PIPING AS LOW AS POSSIBLE.

## GENERAL NOTES

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2. ILLINOIS PLUMBING CODE APPLICABLE
3. NATIONAL ELECTRICAL CODE APPLICABLE - 2008 NEC
4. REFER TO EQUIPMENT LISTS ON SHEETS AQ0.2
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## PLUNGE POOL / LAZY RIVER DATA

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| VOLUME | |
| LAZY RIVER ZERO DEPTH: | 9,600 GAL. |
| LAZY RIVER PLUNGE: | 10,440 GAL. |
| LAZY RIVER CHANNEL: | 218,991 GAL. |
| TOTAL LAZY RIVER VOLUME: (INCLUDING SURGE) | 239,031 GAL. |
| PLUNGE POOL VOLUME: | 19,865 GAL. |
| TOTAL VOLUME: | 258,896 GAL. |
| DESIGN FLOW RATE | |
| LAZY RIVER ZERO DEPTH: | 160 GPM |
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## PLUNGE POOL / LAZY RIVER EQUIPMENT TAGS

A. FILTER
B. FILTRATION PUMP
C. VACUUM/ PRESSURE GAUGE
D. PRESSURE GAUGE
E. FLOW METER (EXISTING)
F. HEATER
G. THERMOMETER
H. AQUASTAT (EXISTING)
J. VARIABLE FREQUENCY DRIVE
K. CHLORINATOR (EXISTING)
L. ACID METERING PUMP (EXISTING)

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**AQ2.1**
PLUNGE POOL / LAZY RIVER EXISTING FILTRATION EQUIPMENT PHOTOS




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| TOTAL FLOW RATE: | 2,491 GPM |
| TURNOVER RATE | |
| LAZY RIVER ZERO DEPTH: | 60 MINUTES |
| LAZY RIVER PLUNGE: | 60 MINUTES |
| LAZY RIVER CHANNEL: | 120 MINUTES |
| PLUNGE POOL: | 60 MINUTES |

## PLUNGE POOL / LAZY RIVER EQUIPMENT TAGS

A. FILTER
B. FILTRATION PUMP
C. VACUUM/ PRESSURE GAUGE
D. PRESSURE GAUGE
E. FLOW METER (EXISTING)
F. HEATER
G. THERMOMETER
H. AQUASTAT (EXISTING)
J. VARIABLE FREQUENCY DRIVE
K. CHLORINATOR (EXISTING)
L. ACID METERING PUMP (EXISTING)

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TURTLE CREEK WATER PARK - FILTER RENOVATION
635 N. ASPEN DRIVE
VERNON HILLS, IL 60061
**VERNON HILLS PARK DISTRICT**

ISSUE

| TO | DATE |
|---|---|
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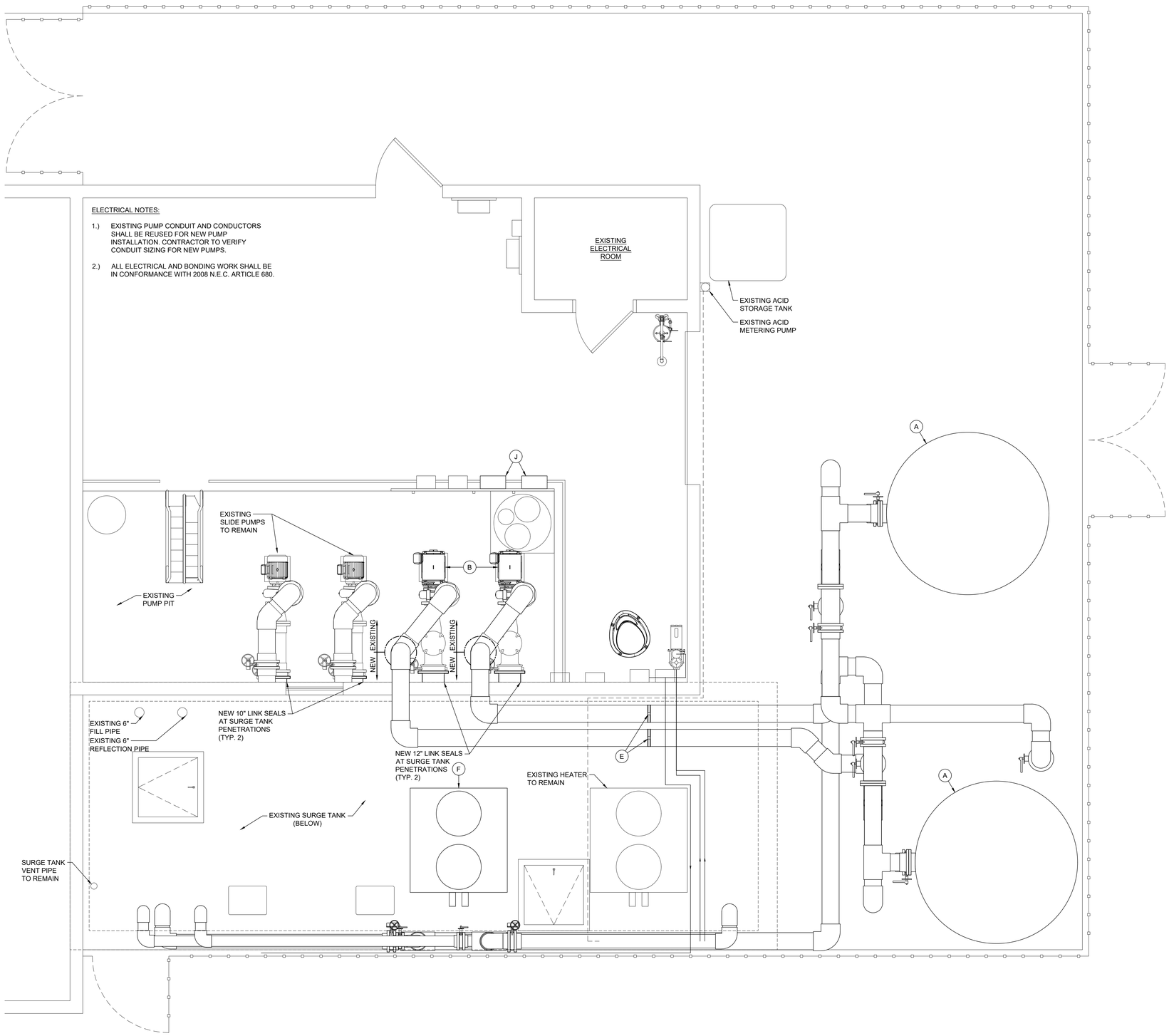
JOB: A2400008

**AQ2.2**
PLUNGE POOL / LAZY RIVER EXISTING FILTRATION EQUIPMENT PHOTOS




1 NEW FILTER EQUIPMENT LAYOUT

SCALE: 3/8" = 1'-0"

## GENERAL NOTES

1. ILLINOIS SWIMMING POOL CODE APPLICABLE
2. ILLINOIS PLUMBING CODE APPLICABLE
3. NATIONAL ELECTRICAL CODE APPLICABLE - 2008 NEC
4. REFER TO EQUIPMENT LISTS ON SHEETS AQ0.2
5. REFER TO ELECTRICAL REQUIREMENTS ON SHEET AQ0.2
6. REFER TO PLUMBING NOTES ON SHEET AQ0.2

## PLUNGE POOL / LAZY RIVER DATA

| | |
|---|---|
| VOLUME | |
| LAZY RIVER ZERO DEPTH: | 9,600 GAL. |
| LAZY RIVER PLUNGE: | 10,440 GAL. |
| LAZY RIVER CHANNEL: | 218,991 GAL. |
| TOTAL LAZY RIVER VOLUME: (INCLUDING SURGE) | 239,031 GAL. |
| PLUNGE POOL VOLUME: | 19,865 GAL. |
| TOTAL VOLUME: | 258,896 GAL. |
| DESIGN FLOW RATE | |
| LAZY RIVER ZERO DEPTH: | 160 GPM |
| LAZY RIVER PLUNGE: | 174 GPM |
| LAZY RIVER CHANNEL: | 1,826 GPM |
| PLUNGE POOL: | 331 GPM |
| TOTAL FLOW RATE: | 2,491 GPM |
| TURNOVER RATE | |
| LAZY RIVER ZERO DEPTH: | 60 MINUTES |
| LAZY RIVER PLUNGE: | 60 MINUTES |
| LAZY RIVER CHANNEL: | 120 MINUTES |
| PLUNGE POOL: | 60 MINUTES |

## PLUNGE POOL / LAZY RIVER EQUIPMENT TAGS

(X)

A. FILTER
B. FILTRATION PUMP
C. VACUUM/ PRESSURE GAUGE
D. PRESSURE GAUGE
E. FLOW METER (EXISTING)
F. HEATER
G. THERMOMETER
H. AQUASTAT (EXISTING)
J. VARIABLE FREQUENCY DRIVE
K. CHLORINATOR (EXISTING)
L. ACID METERING PUMP (EXISTING)

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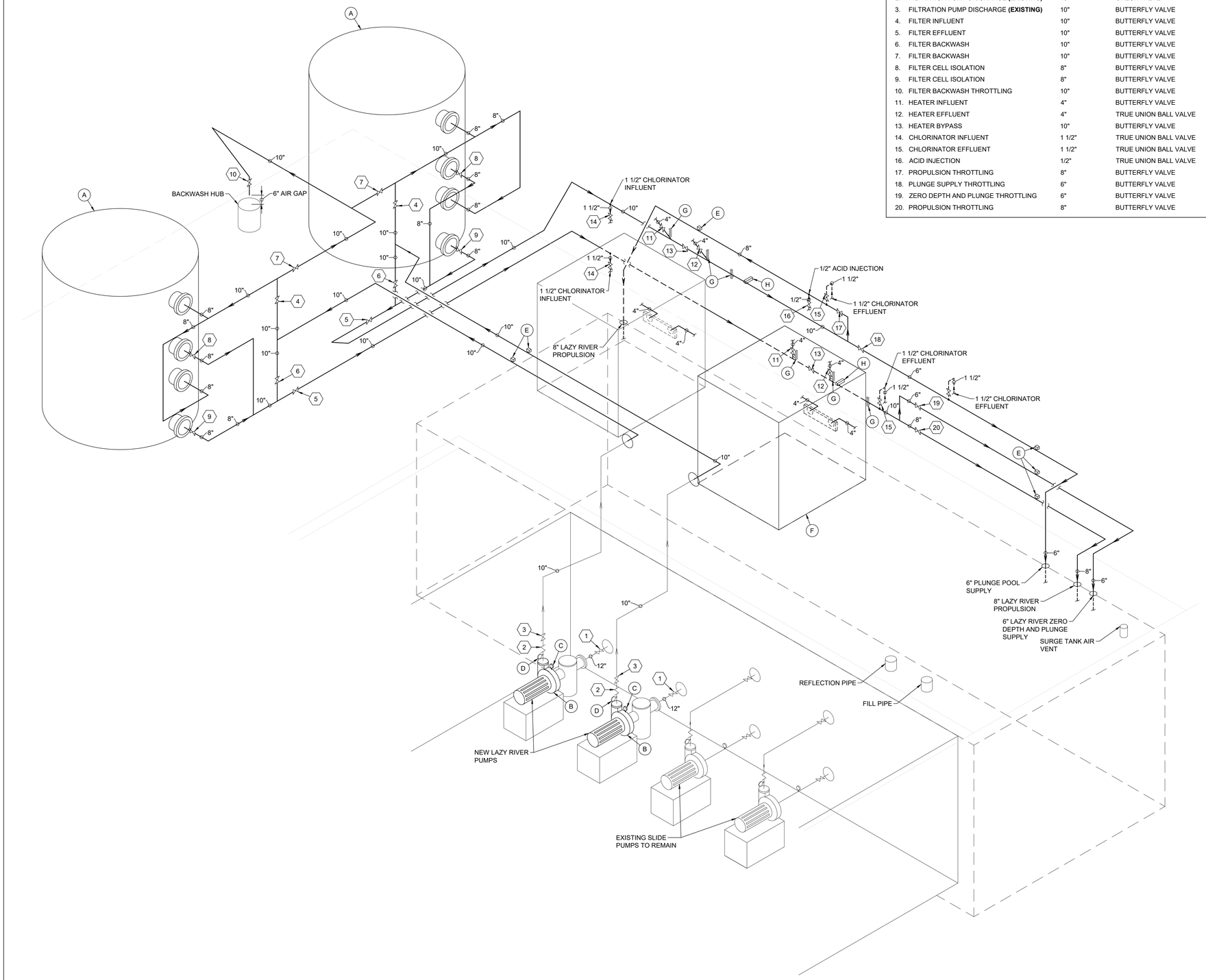
**AQ3.0**
NEW FILTER EQUIPMENT LAYOUT




## PLUNGE POOL / SURGE TANK VALVE LEGEND

| | | | | |
|---|---|---|---|---|
| 1. | PUMP SUCTION **(EXISTING)** | 12" | BUTTERFLY VALVE | QTY.2 |
| 2. | FILTRATION PUMP DISCHARGE **(EXISTING)** | 10" | CHECK VALVE | QTY.2 |
| 3. | FILTRATION PUMP DISCHARGE **(EXISTING)** | 10" | BUTTERFLY VALVE | QTY.2 |
| 4. | FILTER INFLUENT | 10" | BUTTERFLY VALVE | QTY.2 |
| 5. | FILTER EFFLUENT | 10" | BUTTERFLY VALVE | QTY.2 |
| 6. | FILTER BACKWASH | 10" | BUTTERFLY VALVE | QTY.2 |
| 7. | FILTER BACKWASH | 10" | BUTTERFLY VALVE | QTY.2 |
| 8. | FILTER CELL ISOLATION | 8" | BUTTERFLY VALVE | QTY.2 |
| 9. | FILTER CELL ISOLATION | 8" | BUTTERFLY VALVE | QTY.2 |
| 10. | FILTER BACKWASH THROTTLING | 10" | BUTTERFLY VALVE | QTY.1 |
| 11. | HEATER INFLUENT | 4" | BUTTERFLY VALVE | QTY.2 |
| 12. | HEATER EFFLUENT | 4" | TRUE UNION BALL VALVE | QTY.2 |
| 13. | HEATER BYPASS | 10" | BUTTERFLY VALVE | QTY.2 |
| 14. | CHLORINATOR INFLUENT | 1 1/2" | TRUE UNION BALL VALVE | QTY.2 |
| 15. | CHLORINATOR EFFLUENT | 1 1/2" | TRUE UNION BALL VALVE | QTY.3 |
| 16. | ACID INJECTION | 1/2" | TRUE UNION BALL VALVE | QTY.1 |
| 17. | PROPULSION THROTTLING | 8" | BUTTERFLY VALVE | QTY.1 |
| 18. | PLUNGE SUPPLY THROTTLING | 6" | BUTTERFLY VALVE | QTY.1 |
| 19. | ZERO DEPTH AND PLUNGE THROTTLING | 6" | BUTTERFLY VALVE | QTY.1 |
| 20. | PROPULSION THROTTLING | 8" | BUTTERFLY VALVE | QTY.1 |

1 NEW FILTRATION PIPING DIAGRAM

SCALE: N.T.S.

## GENERAL NOTES

1. ILLINOIS SWIMMING POOL CODE APPLICABLE
2. ILLINOIS PLUMBING CODE APPLICABLE
3. NATIONAL ELECTRICAL CODE APPLICABLE - 2008 NEC
4. REFER TO EQUIPMENT LISTS ON SHEETS AQ0.2
5. REFER TO ELECTRICAL REQUIREMENTS ON SHEET AQ0.2
6. REFER TO PLUMBING NOTES ON SHEET AQ0.2

## PLUNGE POOL / LAZY RIVER DATA

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|---|---|
| VOLUME | |
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| DESIGN FLOW RATE | |
| LAZY RIVER ZERO DEPTH: | 160 GPM |
| LAZY RIVER PLUNGE: | 174 GPM |
| LAZY RIVER CHANNEL: | 1,826 GPM |
| PLUNGE POOL: | 331 GPM |
| TOTAL FLOW RATE: | 2,491 GPM |
| TURNOVER RATE | |
| LAZY RIVER ZERO DEPTH: | 60 MINUTES |
| LAZY RIVER PLUNGE: | 60 MINUTES |
| LAZY RIVER CHANNEL: | 120 MINUTES |
| PLUNGE POOL: | 60 MINUTES |

## PLUNGE POOL / LAZY RIVER EQUIPMENT TAGS

A. FILTER
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C. VACUUM/ PRESSURE GAUGE
D. PRESSURE GAUGE
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**AQ3.1**
FILTRATION PIPING DIAGRAM AND VALVE LEGEND

## PLUNGE POOL / SURGE TANK VALVE LEGEND

| | | | | |
|---|---|---|---|---|
| 1. | PUMP SUCTION **(EXISTING)** | 12" | BUTTERFLY VALVE | QTY.2 |
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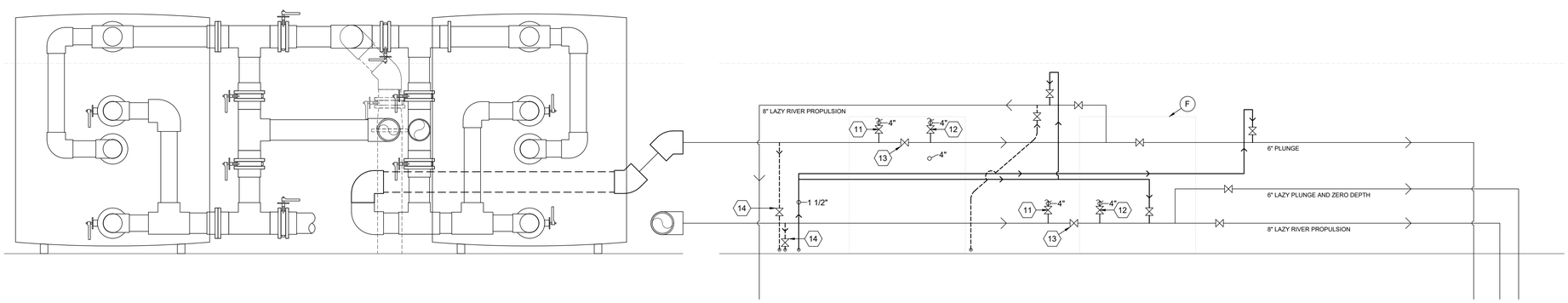


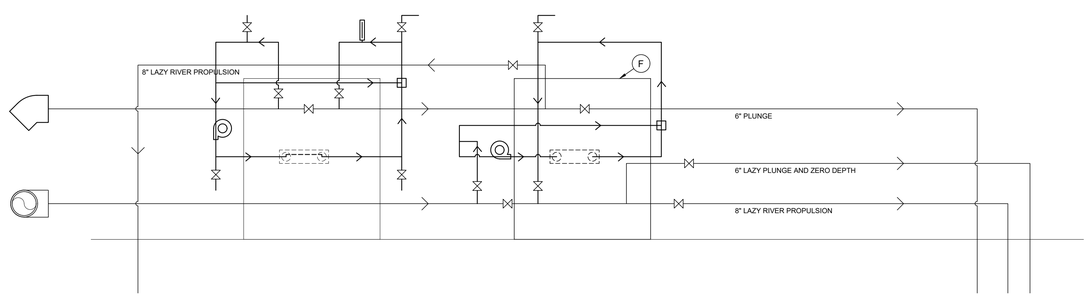


1 HEATER PIPING DIAGRAM

SCALE: N.T.S.

## GENERAL NOTES

1. ILLINOIS SWIMMING POOL CODE APPLICABLE
2. ILLINOIS PLUMBING CODE APPLICABLE
3. NATIONAL ELECTRICAL CODE APPLICABLE - 2008 NEC
4. REFER TO EQUIPMENT LISTS ON SHEETS AQ0.2
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## PLUNGE POOL / LAZY RIVER DATA

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| DESIGN FLOW RATE | |
| LAZY RIVER ZERO DEPTH: | 160 GPM |
| LAZY RIVER PLUNGE: | 174 GPM |
| LAZY RIVER CHANNEL: | 1,826 GPM |
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| TOTAL FLOW RATE: | 2,491 GPM |
| TURNOVER RATE | |
| LAZY RIVER ZERO DEPTH: | 60 MINUTES |
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| PLUNGE POOL: | 60 MINUTES |

## PLUNGE POOL / LAZY RIVER EQUIPMENT TAGS

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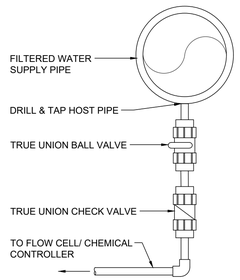
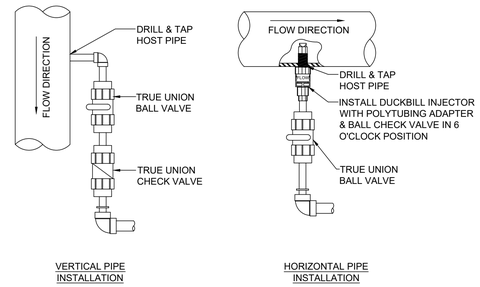
**AQ3.2**
HEATER PIPING DIAGRAM AND VALVE LEGEND




2 SAMPLE STREAM DETAIL — SCALE N.T.S




3 CHEMICAL INJECTION DETAIL — SCALE N.T.S

## GENERAL NOTES

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## PLUNGE POOL / LAZY RIVER DATA

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## PLUNGE POOL / LAZY RIVER EQUIPMENT TAGS

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J. VARIABLE FREQUENCY DRIVE
K. CHLORINATOR (EXISTING)
L. ACID METERING PUMP (EXISTING)

PENTAIR

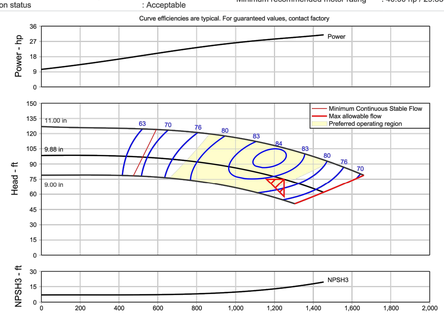
Customer :
Project name :

**Pump Performance Datasheet**
Encompass 3.0 - 24.1.1

| | | | |
|---|---|---|---|
| Item Number / Tags | : Default | Size | : 3801 - 5x6x11 |
| Service | : | Stages | : 1 |
| Quantity | : 2 | Based on curve number | : 3800_5x6x11_1800 Rev 0 |
| Quote number | : | Basic model number | : 5x6x11 3801 1800-CL |
| | | Date last saved | : 24 Jun 2024 12:36 PM |

| Operating Conditions | | Liquid | |
|---|---|---|---|
| Flow, rated | : 1,250.0 USgpm | Liquid type | : Water |
| Differential head / pressure, rated (requested) | : 75.00 ft | Additional liquid description | : |
| Differential head / pressure, rated (actual) | : 76.60 ft | Solids diameter, max | : 0.00 in |
| Suction pressure, rated / max | : 0.00 / 0.00 psi.g | Solids diameter limit | : 1.20 in |
| NPSH available, rated | : Ample | Solids concentration, by volume | : 0.00 % |
| Site Supply Frequency | : 60 Hz | Temperature, max | : 68.00 deg F |
| **Performance** | | Fluid density, rated / max | : 1.000 / 1.000 SG |
| Speed criteria | : Synchronous | Viscosity, rated | : 1.00 cP |
| Speed, rated | : 1800 rpm | Vapor pressure, rated | : 0.34 psi.a |
| Impeller diameter, rated | : 9.88 in | **Material** | |
| Impeller diameter, maximum | : 11.00 in | Material selected | : Standard |
| Impeller diameter, minimum | : 9.00 in | **Pressure Data** | |
| Efficiency | : 82.07 % | Maximum working pressure | : 42.72 psi.g |
| PEI (CL) | : 0.98 | Maximum allowable working pressure | : 175.0 psi.g |
| NPSH required / margin required | : 13.98 / 0.00 ft | Maximum allowable suction pressure | : 175.0 psi.g |
| nq (imp. eye flow) / S (imp. eye flow) | : 37 / 183 Metric units | Hydrostatic test pressure | : 125.0 psi.g |
| Minimum Continuous Stable Flow | : 522.0 USgpm | **Driver & Power Data (@Max density)** | |
| Head, maximum, rated diameter | : 98.70 ft | Driver sizing specification | : Max Power |
| Head rise to shutoff | : 31.28 % | Margin over specification | : 0.00 % |
| Flow, best eff. point | : 1,085.9 USgpm | Service factor | : 1.00 |
| Flow ratio, rated / BEP | : 115.11 % | Power, hydraulic | : 23.67 hp |
| Diameter ratio (rated / max) | : 89.77 % | Power, rated | : 28.84 hp |
| Head ratio (rated dia / max dia) | : 70.82 % | Power, maximum, rated diameter | : 30.85 hp |
| Cq/Ch/Ce/Cn [ANSI/HI 9.6.7-2010] | : 1.00 / 1.00 / 1.00 / 1.00 | Minimum recommended motor rating | : 40.00 hp / 29.83 kW |
| Selection status | : Acceptable | | |

Curve efficiencies are typical. For guaranteed values, contact factory




4 FILTRATION PUMP CURVE — SCALE: N.T.S.

MINIMUM REQUIRED SUPPORT SPACING (IN FEET)

| NOM PIPE SIZE (IN) | PVC PIPE | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | SCHEDULE 40 | | | | | SCHEDULE 80 | | | | |
| | TEMP (°F) | | | | | TEMP (°F) | | | | |
| | 60 | 80 | 100 | 120 | 140 | 60 | 80 | 100 | 120 | 140 |
| 1/2 | 4 1/2 | 4 1/2 | 4 | 2 1/2 | 2 1/2 | 5 | 4 1/2 | 4 1/2 | 3 | 2 1/2 |
| 3/4 | 5 | 4 1/2 | 4 | 2 1/2 | 2 1/2 | 5 1/2 | 5 | 4 1/2 | 3 | 2 1/2 |
| 1 | 5 1/2 | 5 | 4 1/2 | 3 | 2 1/2 | 6 | 5 1/2 | 5 | 3 1/2 | 3 |
| 1 1/4 | 5 1/2 | 5 1/2 | 5 | 3 | 3 | 6 | 6 | 5 1/2 | 3 1/2 | 3 |
| 1 1/2 | 6 | 5 1/2 | 5 | 3 1/2 | 3 | 6 1/2 | 6 | 5 1/2 | 3 1/2 | 3 1/2 |
| 2 | 6 | 5 1/2 | 5 | 3 1/2 | 3 | 7 | 6 1/2 | 6 | 4 | 3 1/2 |
| 2 1/2 | 7 | 6 1/2 | 6 | 4 | 3 1/2 | 7 1/2 | 7 1/2 | 6 1/2 | 4 1/2 | 4 |
| 3 | 7 | 7 | 6 | 4 | 3 1/2 | 8 | 7 1/2 | 7 | 4 1/2 | 4 |
| 4 | 7 1/2 | 7 | 6 1/2 | 4 1/2 | 4 | 9 | 8 1/2 | 7 1/2 | 5 | 4 1/2 |
| 6 | 8 1/2 | 8 | 7 1/2 | 5 | 4 1/2 | 10 | 9 1/2 | 9 | 6 | 5 |
| 8 | 9 | 8 1/2 | 8 | 5 | 4 1/2 | 11 | 10 1/2 | 9 1/2 | 6 1/2 | 5 1/2 |
| 10 | 10 | 9 | 8 1/2 | 5 1/2 | 5 | 12 | 11 | 10 | 7 | 6 |
| 12 | 11 1/2 | 10 1/2 | 9 1/2 | 6 1/2 | 5 1/2 | 12 | 11 | 10 | 7 | 6 |

* SUPPORT VERTICALLY AND HORIZONTALLY

5 PIPE SUPPORT SPACING — SCALE N.T.S

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**AQ3.3**
FILTER EQUIPMENT DETAILS