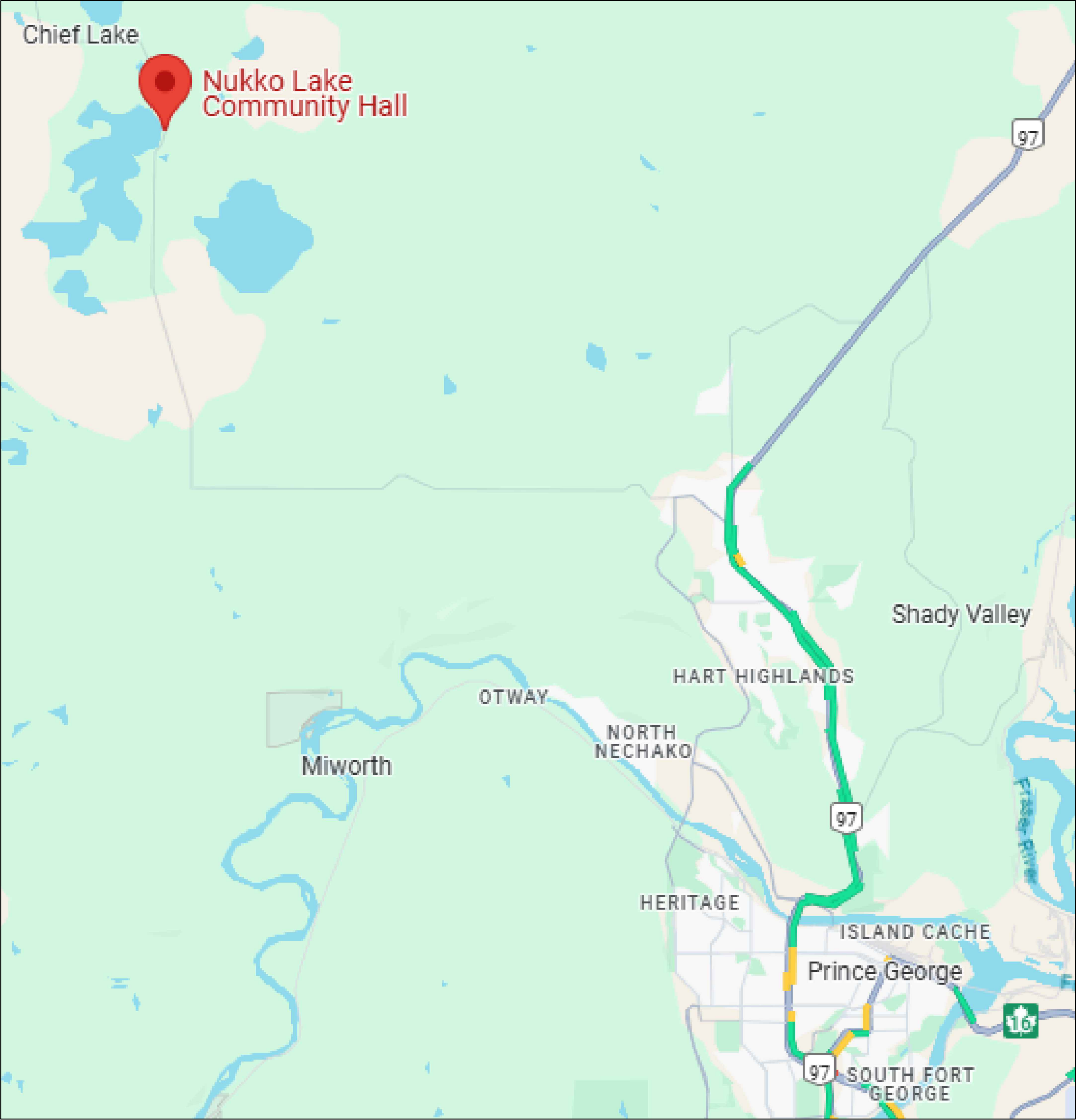


McElhanney Cover D - 2024-02-05
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CLIENT	REGIONAL DISTRICT OF FRASER-FORT GEORGE		
ADDRESS / CONTACT INFO.	155 GEORGE STREET, PRINCE GEORGE, BC, V2L 1P8		
PROJECT NAME	NUKKO LAKE WATER TREATMENT SYSTEM		
DESCRIPTION	NUKKO LAKE COMMUNITY HALL		
McELHANNEY PROJECT	2341-21215-13		
STATUS	ISSUED FOR TENDER		



McElhanney

12 - 556 North Nechako Road,
Prince George BC V2K 1A1
Tel. 250 561 2229

DRAWING LIST								
SHEET #	SHEET TITLE	REVISIONS						
		PA	PB	PC	0	1	2	3
C001	SPECIFICATIONS	X	X		X			
C002	SPECIFICATIONS	X	X		X			
C100	PIPING LAYOUT - PLAN VIEW	X	X		X			
C101	PIPING LAYOUT - SECTION VIEW A	X	X		X			
C102	PIPING LAYOUT - SECTION VIEW B	X	X		X			

SUMMARY OF WORKS

- WORKS COVERED BY THE CONTRACT SHALL INCLUDE NEW CONSTRUCTION, EQUIPMENT INSTALLATION AND COMMISSIONING OF THE NUKKO LAKE COMMUNITY HALL WATER TREATMENT SYSTEM (WTS), LOCATED NEAR NUKKO LAKE, BC.
2. THE SCOPE OF WORK INCLUDES:
- .1 UPGRADES TO THE EXISTING WTS. THIS INCLUDES SUPPLY OF ALL NECESSARY MATERIALS AND COMPONENTS INDICATED ON THE TENDER DRAWINGS OR AS REQUIRED FOR A COMPLETE INSTALLATION.
 - .2 INSTALLATION OF WTS EQUIPMENT AS DETAILED IN THIS TENDER PACKAGE, AND SHALL INCLUDE, BUT IS NOT LIMITED TO:
 - 1 BASKET STRAINER
 - 2 FILTER CARTRIDGE HOUSINGS
 - 3 FILTER CARTRIDGES, INCLUDING 5-MICRON, 1-MICRON ABSOLUTE AND GAC CARTRIDGES.
 - 4 UV REACTOR
 - 5 ANY OTHER EQUIPMENT IN THIS TENDER PACKAGE.
 - 6 ANY OTHER EQUIPMENT OR ANCILLARIES AS IDENTIFIED BY THE CONTRACTOR. THE CONTRACTOR WILL IDENTIFY AND ITEMIZE ANCILLARY ITEMS THAT WILL BE PROVIDED AS PART OF THIS SCOPE OF WORK FOR THE SYSTEM TO BE COMPLETE AND FUNCTIONAL.
 - .3 SUPPLY AND INSTALL ALL PIPING WITHIN THE WTS FACILITY, CONNECTION TO EXISTING WATER PIPES, AND OTHER APPURTENANCES INCLUDING FITTINGS, COUPLINGS, PIPE SPECIALS, SUPPORTS, CONNECTING HARDWARE, AND RELATED PIPING COMPONENTS AND ACCESSORIES.
 - .4 SUPPLY AND INSTALL WTS VALVES AND APPURTENANCES TO ALLOW FOR ISOLATION AND OPERATION OF THE WTS. THESE ITEMS INCLUDE, BUT ARE NOT LIMITED TO, AUTOMATED VALVES, MANUAL ISOLATION VALVES, CHECK VALVES, PRESSURE RELIEF VALVES, AIR RELEASE VALVES, AIR VACUUM VALVES, VENTS, DRAINS AND ANY OTHER VALVES AS INDICATED ON THE TENDER DRAWINGS OR AS REQUIRED FOR A COMPLETE INSTALLATION.
 - .5 PROVIDE ONE DEDICATED 15A - 120V CIRCUIT FOR THE UV REACTORS, AND CONTROL UNIT FROM THE NEAREST SUITABLE ELECTRICAL PANEL. PROVIDE ALL REQUIRED ELECTRICAL MATERIALS LABOUR AND ANY OTHER ITEMS OR COMPONENTS INDICATED ON THE TENDER DRAWINGS REQUIRED FOR A COMPLETE AND OPERATIONAL TREATMENT SYSTEM.
 - .6 SUPPLY AND INSTALL WTS INSTRUMENTATION. INSTRUMENTATION SHALL INCLUDE THE INSTRUMENTATION AS LISTED IN THE TENDER DOCUMENTATION, AND AS REQUIRED FOR A COMPLETE INSTALLATION.
 - .7 COORDINATION WITH THE DISTRICT IN PREPARATION AND SCHEDULING OF THE WORK AND DEVELOPING A SCHEDULE, WHICH MINIMIZES THE CONSTRUCTION PERIOD AND DETAILS ALL MAJOR PHASES OF WORK.
 - .8 START UP, TESTING AND COMMISSIONING OF ALL INSTALLED EQUIPMENT AND SYSTEMS AS SPECIFIED IN THE CONTRACT DOCUMENTS.
 - .9 CORRECTION OF DEFICIENCIES FOUND OR DETECTED DURING THE COURSE OF THE WORK OR DURING START UP, TESTING OR COMMISSIONING ACTIVITIES.
 - .10 MOBILIZATION AND DEMOBILIZATION (AS APPLICABLE) FOR THE WORK AT SITE. INCLUDED IN MOBILIZATION ARE SUCH ITEMS AS INSURANCE, MOVING PERSONNEL, MATERIALS AND EQUIPMENT TO THE SITE, AND ALL PREPARATION FOR PERFORMING THE SCOPE OF WORKS. INCLUDED IN DEMOBILIZATION ARE PREPARATION AND SUBMISSION OF OPERATION AND MAINTENANCE MANUALS, REMOVAL OF ALL PERSONNEL, MATERIALS AND EQUIPMENT, AND CLEANUP OF THE SITE.
 - .11 REMOVAL AND/OR CONVERSION OF EXISTING SELECT STRUCTURES AND EQUIPMENT COMPONENTS, AS SPECIFIED IN THIS DOCUMENT AND OTHER SPECIFICATIONS UNDER THIS PROJECT.
 - .13 ALL OTHER ITEMS REQUIRED TO COMPLETE THE WORK AND PROVIDE A COMPLETE WORKING NEW WATER TREATMENT SYSTEM AS INDICATED ON THE CONTRACT DOCUMENTS.
3. EQUIPMENT FOR RE-USE INCLUDES THE PENTAIR MYERS HCM SERIES CONVERTIBLE DEEP WELL JET PUMP MODEL HCM 150-K, WITH A 1.5 HP GE MOTOR AND PRESSURE SWITCH & GAUGE; AND THE FLEXICON WELLRITE WR360R PRESSURE TANK. THE RAW WATER PUMP SHALL BE DESIGNED TO OPERATE AT 18 GPM.

GENERAL NOTES

1. PROVIDE COMPLETE, FULLY TESTED BY THE AUTHORITY HAVING JURISDICTION AND OPERATIONAL MECHANICAL SYSTEMS TO MEET THE REQUIREMENTS DESCRIBED HEREIN AND IN COMPLETE ACCORDANCE WITH ALL APPLICABLE CODES, ORDINANCES, INDUSTRY ACCEPTED STANDARDS, SPECIFICATIONS, PRACTICES, POLICIES, AND PROCEDURES (E.G., NSF, NH, ANSI, ASME, BRITISH COLUMBIA ELECTRICAL CODE, CSA, EGC, MOTI, BC BUILDING CODE, ETC.). THE MECHANICAL CONTRACTOR SHALL PROVIDE LABOR, MATERIALS, AND EQUIPMENT TO COMPLETE THE MECHANICAL WORK AS SPECIFIED, ANY DEVIATION FROM THE STANDARDS OR QUALITY DEFINED BY THE STANDARDS MUST BE EXPLICITLY AND EXPRESSLY PRE-APPROVED IN WRITING BY THE OWNER.
2. THE DRAWINGS ACCOMPANYING THIS SPECIFICATION ARE TO BE CONSIDERED AS DIAGRAMMATIC ONLY AND DO NOT SHOW ALL THE STRUCTURAL AND CONSTRUCTION DETAILS. ANY INFORMATION INVOLVING BUILDING DIMENSIONS SHALL BE TAKEN FROM SITE MEASUREMENTS.
3. THESE DRAWINGS AND SPECIFICATIONS SHALL BE CONSIDERED AN INTEGRAL PART OF THE CONTRACT DOCUMENTS. NEITHER THE DRAWINGS NOR THE SPECIFICATIONS SHALL BE USED ALONE. MISINTERPRETATION OF ANY REQUIREMENTS OF EITHER PLANS OR SPECIFICATIONS SHALL NOT CHANGE THE REQUIREMENTS OR INTENT OF THE SPECIFICATION FOR PROPER COMPLETION OF THE WORK TO THE FULL ACCEPTANCE OF THE ENGINEER.
4. MOST STRINGENT REQUIREMENTS OF ALL SECTIONS SHALL BE ADHERED TO. SHOULD ANY DISCREPANCY APPEAR BETWEEN THESE SPECIFICATIONS AND THE DRAWINGS TO CAUSE DOUBT AS TO THE TRUE MEANING AND INTENT OF THE DRAWINGS AND SPECIFICATIONS, A RULING SHALL BE OBTAINED FROM THE ENGINEER BEFORE SUBMITTING A PRICE. IF THIS IS NOT DONE IT WILL BE ASSUMED THAT THE MORE EXPENSIVE ALTERNATIVE HAS BEEN INCLUDED IN THE CONTRACT.
5. THE NEWEST SPECIFICATION SHALL BE ASSUMED INCLUDING BUT NOT LIMITED TO ASTM, AND AWWA.
6. ANY ERROR, INCONSISTENCY, CONFLICTS OR WORK NOT INDICATED IN THE CONTRACT DRAWINGS OR SPECIFICATIONS NOTED AFTER THE AWARD OF CONTRACT MUST BE REPORTED TO THE ATTENTION OF THE ENGINEER BEFORE COMMENCING WORK.
7. CONTRACTOR TO PROVIDE ENGINEER MATERIALS AND LABOR BREAKDOWN FOR EACH ITEM LISTED ON CHANGE NOTICES. CONTRACTOR ALSO TO RECEIVE THE SAME FROM ALL AFFECTED SUB-TRADES AND INCLUDE IN THE BREAKDOWN SUBMITTED. ADDITIONAL INFORMATION SHALL BE PROVIDED AS PER ENGINEER REQUEST.
8. FOLLOW MANUFACTURER'S RECOMMENDED INSTALLATION DETAILS AND PROCEDURES FOR EQUIPMENT, SUPPLEMENTED BY THE REQUIREMENTS OF THE CONTRACT DOCUMENTS. THESE DRAWINGS ARE NOT TO BE CONSIDERED DETAILED INSTALLATION INSTRUCTIONS.
9. ASSUME RESPONSIBILITY FOR DAMAGE CAUSED TO THE OWNER OR OTHERS BY IMPROPER WORK. PROTECT ALL WORK FROM DAMAGE.
10. THE OWNER RESERVES THE RIGHT TO DELETE ANY OF THE WORK FROM THE CONTRACT.
11. INSTALL EQUIPMENT AND PIPING GENERALLY IN LOCATIONS AND ROUTES SHOWN IN THIS TENDER PACKAGE, CLOSE TO THE BUILDING STRUCTURE WITH MINIMUM INTERFERENCE WITH OTHER SERVICES OR FREE SPACE.
12. PROTECT ANY EXISTING SERVICES. IF SHUTDOWNS DURING NORMAL WORKING HOURS ARE UN-AVOIDABLE, THE EXACT LENGTH OF SHUTDOWN AND DURATION OF SHUTDOWN TO BE COORDINATED AND APPROVED BY OWNER'S CONSTRUCTION REPRESENTATIVE A MINIMUM OF ONE WEEK IN ADVANCE. EXACT LOCATIONS OF SERVICES ON SITE ARE TO BE VERIFIED PRIOR TO STARTING WORK.
13. ALL WORK TO BE COMPLETED IN AN ORGANIZED AND ORDERLY MANNER WITH ATTENTION ALSO DIRECTED TOWARDS CONSERVING HEADROOM AND AVOIDING INTERFERENCE WITH THE FREE USE OF SPACE IN WHICH THE WORK PASSES. ALL PIPES AT CEILING SHALL BE KEPT AS TIGHT AS POSSIBLE TO BEAMS OR OTHER LIMITING MEMBERS.
14. FIELD VERIFY ALL BUILDING AND SITE DIMENSIONS PRIOR TO ANY FABRICATION AND INSTALLATION OF EQUIPMENT OR MATERIALS. NO ADDITIONAL CHARGE WILL BE ENTERTAINED FOR FAILURE TO VERIFY THESE DIMENSIONS ON SITE.
15. THE LAYOUT OF THE MECHANICAL SYSTEMS AND EQUIPMENT IN THIS TENDER PACKAGE IS BASED UPON ESTIMATES OF PHYSICAL DIMENSIONS. USING THE CONTRACTOR'S EQUAL OR ALTERNATE EQUIPMENT, THE CONTRACTOR SHALL BE RESPONSIBLE FOR EQUIPMENT LAYOUT AND PIPING CONNECTIONS. ANY COSTS TO ACCOMMODATE REVISIONS TO SUIT OTHER THAN SPECIFIED EQUIPMENT WILL NOT BE CONSIDERED ADDITIONAL COSTS.
16. INSTALL ALL MECHANICAL EQUIPMENT AND SERVICES IN ORDER THAT MAINTENANCE AND DISASSEMBLY WILL HAVE MINIMUM DISTURBANCE TO CONNECTING PIPING OR DUCT SYSTEMS.
17. ALL EQUIPMENT SHALL BE INSTALLED WITH ADEQUATE ACCESS FOR INSPECTION AND SERVICING.
18. COORDINATE WITH ALL OTHER SUB-TRADES AT THE START AND THROUGHOUT THE PROJECT TO PREVENT AVOIDABLE CONFLICTS. IF THERE IS A CONCERN OF CONFLICT, RESOLUTION SHALL BE COORDINATED BY THE CONTRACTOR. IF CONFLICTS ARE UNAVOIDABLE, CONTACT THE OWNER IMMEDIATELY TO ASSIST WITH A SOLUTION.
19. PROVIDE FIRE STOPPING MEASURES AT PENETRATIONS OF ALL RATED WALL ASSEMBLIES IN ACCORDANCE WITH APPLICABLE CODES AND STANDARDS.
20. COORDINATE LOCATION OF OPENINGS REQUIRED FOR WORK WITH RESPECTIVE TRADES AND CONTRACTORS.
21. PROVIDE CLEARLY MARKED-UP RECORD DRAWINGS IDENTIFYING SYSTEMS, THEIR COMPONENTS, DIMENSIONS, SIZES, ARRANGEMENTS, INVERTS, MATERIALS, ETC. DO NOT CONCEAL WORK UNTIL PIPING IS TESTED IN ACCORDANCE WITH THE AUTHORITY HAVING JURISDICTION AND REQUIRED INFORMATION IS RECORDED. INACCURATE ASSUMPTION OF INFORMATION BEING RECORDED IS UNACCEPTABLE. IN SUCH CASES, AND WHERE DEEMED NECESSARY BY THE OWNER, THE AFFECTED AREAS WILL BE UNCOVERED AND EXPOSED TO RECORD THE CORRECT INFORMATION. WHERE THIS OCCURS, AND THE RECORDED INFORMATION IS DIFFERENT FROM THE ACTUAL SITE CONDITIONS, THE CONTRACTOR WILL RECORD THE CORRECT INFORMATION AND THEN RE-FINISH, AT HIS/HER OWN EXPENSE, THE AFFECTED AREA(S).

TO THE SATISFACTION OF THE OWNER.

22. ANY PROPOSED DEVIATIONS FROM THE PLANS OR SPECIFICATIONS ARE TO BE APPROVED BY THE ENGINEER PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL PROVIDE SUPPORTING INFORMATION, DATA, SPECIFICATIONS, SHOP DRAWINGS AS REQUIRED, IN A TIMELY MANNER TO ALLOW THE ENGINEER TO REVIEW THE PROPOSED DEVIATION AND FOR THE OWNER TO APPROVE.
23. ALL MEASUREMENTS ARE METRIC.

CIVIL GENERAL NOTES

1. ALL WORK AND MATERIALS ARE TO BE AS DESCRIBED IN THE LATEST EDITION OF THE MASTER MUNICIPAL CONSTRUCTION DOCUMENT (MMCD) OR AS OTHERWISE APPROVED BY THE ENGINEER, WHERE A CONFLICT IN SPECIFICATIONS EXISTS, THESE SPECIFICATIONS SHALL GOVERN.
2. ANY EXISTING WORKS DISTURBED DURING CONSTRUCTION IS TO BE RESTORED TO THEIR ORIGINAL CONDITION UNLESS NOTED OTHERWISE.

EQUIPMENT AND MATERIALS

1. PROVIDE EQUIPMENT AS SPECIFIED ON THE DRAWINGS. ALTERNATE EQUIPMENT IS TO BE APPROVED BY THE OWNER IN WRITING. EQUIPMENT NOT SPECIFIED OR APPROVED AS EQUAL MAY BE REJECTED AT THE SHOP DRAWING REVIEW STAGE.
2. ALL EQUIPMENT AND MATERIALS ARE TO MEET INDUSTRY TESTING STANDARDS, BE APPROPRIATELY RESTRAINED SEISMICALLY FOR THE LOCAL SEISMIC ZONE, AND TO BE COMPLETE WITH A MAINTENANCE/OPERATION MANUAL.
3. ALL MECHANICAL EQUIPMENT AND PIPING MATERIALS SHALL BE NEW AND CURRENT MANUFACTURE. ALL SUBSTANDARD WORK WILL BE REJECTED AND ONLY THE HIGHEST QUALITY WILL BE ACCEPTED.
4. ALL MEASUREMENTS SHOULD BE CONSIDERED APPROXIMATE AND THE CONTRACTOR WILL BE RESPONSIBLE FOR VERIFYING MEASUREMENTS PRIOR TO FABRICATION.
5. ALL PRODUCTS SHALL BE DESIGNED AND SUITABLE FOR POTABLE WATER SERVICE. ALL MATERIALS IN CONTACT WITH PROCESS WATER NEED TO BE NSF61 APPROVED.
6. ALL EQUIPMENT, WIRING, CONNECTORS, AND OTHER APPURTENANCES SHALL BE WATERPROOF AND BE OF AN APPROPRIATE MATERIAL THAT RESISTS CORROSION OR DETERIORATION FROM ANY FLUIDS OR GASES THAT WILL BE ROUTINELY PRESENT IN A WATER TREATMENT SYSTEM.
7. AN OPERATION AND MAINTENANCE MANUAL SHALL BE SUPPLIED BY THE CONTRACTOR AND WILL INCLUDE:
 1. DESCRIPTION AND INSTRUCTION OF OPERATION AND MAINTENANCE OF ALL MECHANICAL SYSTEMS
 2. SHOP DRAWINGS OF ALL EQUIPMENT AND MANUFACTURER'S O&M DOCUMENTS
 3. LIST OF TAGGED VALVES/COMPONENTS
 4. EXTENDED WARRANTIES
 5. COPY OF RECORD DRAWINGS
 6. LIST OF INSPECTION AND TEST CERTIFICATES
 7. NAME OF ENGINEER, MECHANICAL CONTRACTOR, GENERAL CONTRACTOR, AND PHONE NUMBER.
 8. MANUAL IS TO BE OF BINDER TYPE CONSTRUCTION PROVIDED WITH PERMANENT LABELS AFFIXED TO THE SPINE AND COVER. LABELS ARE TO HAVE PROJECT NAME, PROJECT DATE, MANUAL TITLE, OWNER, AND ENGINEER NAMES. 3 SETS ARE TO BE SUBMITTED PRIOR TO SUBSTANTIAL PERFORMANCE.
8. THE CONTRACTOR SHALL SUPPLY DIGITAL DRAWINGS (PDF) ILLUSTRATING EXTERNAL DIMENSIONS AND MAJOR STRUCTURAL DETAILS FOR ALL EQUIPMENT, VALVES, AND ALL ASSOCIATED EQUIPMENT TO THE ENGINEER FOR REVIEW. CONTRACTOR TO ALLOW FOR UP TO 10 BUSINESS DAYS FOR REVIEWING SHOP DRAWINGS. ANY MANUFACTURING PRIOR TO APPROVAL SHALL BE AT THE CONTRACTOR'S RISK. SHOP DRAWINGS ARE REQUIRED FOR MAJOR VALVES AND EQUIPMENT ONLY. NO MORE THAN ONE REVISION OF DRAWINGS, SCHEMATICS OR BILL OF MATERIAL WILL BE REVIEWED BY THE ENGINEER. ALL ADDITIONAL REVISIONS WILL BE AT THE COST OF THE CONTRACTOR AND BACK CHARGED THROUGH THE CONTRACT.
9. ALL EQUIPMENT SHALL BE PROTECTED FROM DAMAGE DURING HANDLING, SHIPPING, STORAGE OR INSTALLATION. ALL DAMAGE SHALL BE CORRECTED BY THE CONTRACTOR PRIOR TO COMMISSIONING ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS AND TO THE SATISFACTION OF THE OWNER AND ENGINEER.
10. THE SUPPLIER SHALL INDICATE A LIST OF SPARE PARTS WHICH THEY WOULD RECOMMEND TO BE PURCHASED AND INDIVIDUAL PRICES FOR EACH ITEM.

INSPECTION AND COMMISSIONING

3. ALL NEW COMPONENTS ARE TO BE INSPECTED FOR DAMAGE PRIOR TO INSTALLATION AND ANY DAMAGED COMPONENTS IS TO BE REMOVED FROM THE SITE.
2. THE ENGINEER OR THEIR REPRESENTATIVE MAY CHOOSE TO INSPECT ALL WORK PRIOR TO BEING CONCEALED. PHOTOS OF ANY CONCEALED COMPONENTS SHALL BE PROVIDED, AND IF NOT COMPLETED FOR ANY REASON, RE-EXPOSURE OF THE COMPONENTS SHALL BE COMPLETED. COMMERCIAL OR SCHEDULE OR ANY OTHER REASONS ARE NOT AN EXCUSE FOR FAILURE TO OBTAIN INSPECTION.
3. THE CONTRACTOR IS TO PROVIDE THE ENGINEER REASONABLE NOTICE (7 DAYS FOR LOCAL SITES) PRIOR TO CALLING AN INSPECTION.
4. CONTRACTOR SHALL KEEP AN ACCURATE RECORD OF ALL FIELD CHANGES AND MODIFICATIONS ON A CLEAN SET OF DRAWINGS AS REQUIRED, USING ACCEPTABLE DRAFTING TECHNIQUES. SUBMIT ALL RED-LINE AND RECORD DRAWINGS TO THE ENGINEER PRIOR TO COMMISSIONING. RECEIVING OF RECORD DRAWINGS SHALL BE A PREQUALIFICATION TO SCHEDULING COMMISSIONING.
5. ALL MECHANICAL PIPING SHALL BE PRESSURE TESTED PRIOR TO COMMISSIONING AND FLUSHED OF DEBRIS BEFORE CONNECTING TO THE EXISTING WATER SERVICES. THE ENGINEER SHALL WITNESS PRESSURE TESTING AND FLUSHING TO AT LEAST 1.2M/S WATER VELOCITY.
6. CONTRACTOR SHALL THOROUGHLY FLUSH ALL INDIVIDUAL FIXTURES (INCLUDING FAUCETS, HOSE BIBS, AND SIMILAR OUTLETS) THROUGHOUT THE NUKKO LAKE COMMUNITY HALL TO REMOVE ANY ACCUMULATED DEBRIS AND MINIMIZE POTENTIAL BUILDUP.
7. THE CONTRACTOR SHALL ENSURE NEW INSTALLATIONS IN CONTACT WITH POTABLE WATER ARE DISINFECTED TO AWWA 651 AND 653 STANDARDS. DOCUMENTATION OF THE DISINFECTION PROCEDURE AND RESIDUAL TEST MUST BE PROVIDED TO THE OWNER PRIOR TO PUTTING THE WATER SYSTEM IN SERVICE TO DISTRIBUTION.
8. HYDROSTATIC TESTING AT THE CONTRACTORS COST SHALL BE:
 1. 1.5x WORKING PRESSURE (MIN. 150PSI) FOR GROOVED OR THREADED JOINTS AND WELDED JOINTS, TESTED PRIOR TO COMMISSIONING, IN SITU FULLY ASSEMBLED.
 2. 60 MINUTE TEST, ZERO PRESSURE DROP / LEAKAGE AND NO VISIBLE WET AREAS / DRIPS. PRESSURE TEST MUST USE TWO RECENTLY CERTIFIED PRESSURE GAUGES WITH A RANGE NOT EXCEEDING 150% OF THE TEST PRESSURE.
 3. CONFIRM WITH ENGINEER FOR FINAL TEST PRESSURES.
 4. ENGINEER'S TIME ON SITE WILL BE BACKCHARGED TO THE CONTRACTOR FOR ALL FAILED TESTS OR DELAYS ON SITE.
9. CONTRACTOR SHALL PROVIDE THE FOLLOWING QUALITY ASSURANCE ITEMS:
 1. A CONCISE LIST OF TESTING REQUIRED ON SITE FOR THE FULL COMMISSIONING OF THE SYSTEM.
 2. ACCEPTANCE OF SHIPPED GOODS THAT ARE FREE OF DEFECTS OR DAMAGE DUE TO SHIPPING AND ARE COMPLETE IN ALIGNMENT WITH THE SHIPPING BILL OF GOODS AND THAT STORAGE PRESERVATION IS ACCEPTABLE FOR THE PLANNED DURATION BEFORE INSTALLATION.
 3. ACKNOWLEDGEMENT THAT THE SYSTEM IS READY FOR INSTALLATION.
 4. ACKNOWLEDGEMENT THAT SYSTEM IS INSTALLED TO THE CONTRACTOR'S SATISFACTION AND SYSTEM CAN BEGIN COMMISSIONING AND START UP.
 5. ACKNOWLEDGEMENT THAT THE SYSTEM IS FULLY COMMISSIONED AND READY FOR TURN OVER TO OWNER'S OPERATOR OF RECORD.
 6. ACKNOWLEDGEMENT THAT THE SYSTEM IS FULLY COMMISSIONED AND READY FOR SERVICE TO THE WATER DISTRIBUTION SYSTEM.
 7. ACKNOWLEDGEMENT THAT THE RECORD DOCUMENTATION HAS BEEN COMPLETED AND DRAWINGS ARE CERTIFIED AS CORRECT.
10. COMMISSIONING SHALL ONLY BE SCHEDULED WHEN THE CONTRACTOR HAS INFORMED THE ENGINEER OF READINESS. FAILURE OF THE CONTRACTOR TO BE READY WILL RESULT IN ALL COSTS FOR ALL PARTIES BACK CHARGED TO THE CONTRACTOR INCLUDING EXTRA COSTS DUE TO DELAYS, STANDBY TIME, OR OTHER COST OVERRUNS. COMMISSIONING SHALL BE LED BY THE CONTRACTOR. ONCE THE WTS IS READY FOR WET TESTING, THE CONTRACTOR SHALL CONFIRM WITH SIGNATURE THAT ALL COMPONENTS ARE READY FOR LIVE TESTING AND ANY DAMAGE IS AT THE CONTRACTOR'S RISK. DRY AND WET TESTING SHALL BE PERFORMED IDENTICALLY TO PROVE THE PROCESS FUNCTION WITH THE CONTRACTOR FURNISHING DOCUMENTATION STATING THE WTS IS READY FOR SERVICE. AT A MINIMUM, WTS PERFORMANCE SHALL BE VERIFIED, WITH INSTRUMENTATION, CONTROLS, ALARMS, AND OTHER FUNCTION SHALL BE VERIFIED FOR SUITABLE LOGIC. AT LEAST 4 WEEKS PRIOR TO COMMISSIONING, THE CONTRACTOR SHALL PROVIDE A CLIENT ACCEPTANCE TESTING / CAT DOCUMENT STATING THE PROCEDURE OF LOOP TESTING, DRY TESTING AND WET TESTING. THE ENGINEER SHALL RETAIN ALL RIGHTS TO ADD OR SUBTRACT TESTING UPON REVIEW OF THE CAT DOCUMENT.

SUPPORT, ANCHORS AND SEALS

1. PROVIDE ALL THE NECESSARY SUPPORTS AND HANGERS TO SECURE MECHANICAL SYSTEMS AND EQUIPMENT. THE CONTRACTOR SHALL PROVIDE ALL STRUCTURAL WORK REQUIRED FOR FOUNDATION AND SUPPORT OF UNITS, FOUNDATION BOLTS, SLEEVES, WASHERS, NUTS, SHIMS AND TEMPLATES TO LOCATE BOLTS.
2. PROVIDE CODE COMPLIANT FIRE STOPPING MEASURES AT ALL DUCT AND PIPING PENETRATIONS THROUGH RATED WALLS.
3. PROVIDE ISOLATION AND PREVENT CONTACT WITH DISSIMILAR MATERIALS.
4. ALL EXPOSED PIPING PENETRATIONS SHALL BE PROVIDED WITH ESCUTCHEONS AT THE PENETRATION POINT.
5. GROUT FOR PIPE SUPPORTS AND PIPING INSERTS: GROUT FOR BASE ELBOW AND PIPE SUPPORTS SHALL BE A HIGH STRENGTH NON-SHRINK GROUT. ALL GROUT SHALL BE MASTERFLOW 928.

PIPING

1. ALL PIPING IN THE WATER TREATMENT SYSTEM SHALL:
 - .1 BE DESIGNED AND MANUFACTURED IN ACCORDANCE WITH ASME, AWWA OR CSA STANDARDS.
 - .2 USE SEISMICALLY APPROPRIATE PIPE MATERIALS AND CONNECTIONS FOR ALL PIPES.
 - .3 USE SOCKET WELDED OR THREADED PIPING CONNECTIONS, AND THREADED OR FLANGED EQUIPMENT CONNECTIONS FOR PVC PIPE.
 - .4 STAINLESS STEEL PIPE OR EQUIPMENT CONNECTIONS THAT ARE LESS THAN 75 MM IN DIAMETER SHOULD BE THREADED. SIMILAR UNITS, FLANGE STANDARDS AND THREAD STANDARDS SHOULD BE USED THROUGHOUT THE FACILITY.
 - .5 BE APPROPRIATE FOR THE TYPE OF LIQUID TO BE CONVEYED.
 - .6 HAVE PROPER ISOLATION THROUGH VALVES, SPECTACLE BLINDS AND PIPE SECTIONS TO ALLOW FOR REPAIR OR REPLACEMENT.
 - .7 PROVIDE COUPLINGS DOWNSTREAM OF ISOLATION VALVES TO ALLOW FOR MAINTENANCE OF PIPING.
 - .8 BE MADE OF SIMILAR MATERIALS (E.G. PIPE APPURTENANCES); OTHERWISE, DIELECTRIC COUPLINGS
 - .9 SHOULD BE EMPLOYED TO REDUCE GALVANIC CORROSION. IF PIPE WITH DISSIMILAR MATERIALS IS CONNECTED, INSULATION KIT SHOULD BE USED TO REDUCE GALVANIC CORROSION;
2. PIPING MATERIALS ALLOWED WITHIN THIS CONTRACT INCLUDE:
 - .1 PVC PIPE SCH 80:
 - .1 PVC SCH 80 PIPE CERTIFIED TO CSA B137.3 STANDARD - RIGID POLYVINYL CHLORIDE (PVC) PIPE AND FITTINGS FOR PRESSURE APPLICATIONS.
 - .2 TO ASTM D1785 - STANDARD SPECIFICATION FOR POLY(VINYL CHLORIDE) (PVC) PLASTIC PIPE, SCHEDULES 40, 80, AND 120.
 - .3 TO BE COMPATIBLE WITH FITTINGS WITHOUT SPECIAL ADAPTERS.
 - .4 FITTINGS SHALL BE OF THE SAME MATERIAL AS THE PIPE AND SHALL CONFORM TO CSA B137.2 STANDARD - POLYVINYL CHLORIDE (PVC) INJECTION-MOULDED GASKETED FITTINGS FOR PRESSURE APPLICATIONS.
 - .2 316L STAINLESS STEEL PIPE:
 - .1 PIPE SHALL BE SS 316L, SCHEDULE 10S, CERTIFIED TO ANSI B36.19 STANDARD - STAINLESS STEEL PIPE.
 - .2 TO ASTM A312 / A312M - 17 - STANDARD SPECIFICATION FOR SEAMLESS, WELDED, AND HEAVILY COLD WORKED AUSTENITIC STAINLESS-STEEL PIPES
 - .3 STAINLESS STEEL FITTINGS SHALL BE FABRICATED IN ACCORDANCE WITH ASTM A403/ASME SA403. FITTINGS SHALL BE GRADE WP CLASS W OR AS OTHERWISE APPROVED.
 - .4 DIMENSIONS AND WALL THICKNESS OF PIPE SHALL BE TO ASME B36.19.
 - .5 DIMENSIONS AND TOLERANCES FOR FITTINGS SHALL BE TO ASME B36.19.
 - .6 CERTIFICATION STAINLESS STEEL PIPE IS 316L WITH APPROPRIATE WALL THICKNESS ALONG WITH MATERIALS SPECIFICATION AND MECHANICAL PROPERTIES SHALL BE SUPPLIED PRIOR TO PIPE FABRICATION.

VALVES AND APPURTENANCES

1. ALL VALVES TO BE TO APPROPRIATE AWWA STANDARDS.
2. MANUFACTURER SHALL HAVE A QUALITY MANAGEMENT SYSTEM THAT IS CERTIFIED TO ISO 9001 BY AN ACCREDITED, CERTIFYING BODY. MANUFACTURER SHALL DEMONSTRATE A MINIMUM OF TEN (10) YEARS' EXPERIENCE IN THE MANUFACTURE OF VALVES. THE MANUFACTURER SHALL PROVIDE TEST CERTIFICATES, DIMENSIONAL DRAWINGS, PARTS LIST DRAWINGS AND OPERATION AND MAINTENANCE MANUALS.
3. PVC VALVES
 - .1 PIPE AND FITTINGS SHALL BE MANUFACTURED FROM A PVC COMPOUND THAT MEETS THE REQUIREMENTS OF CELL CLASSIFICATION 12454 POLYVINYL CHLORIDE AS OUTLINED IN ASTM D1784. MATERIALS FROM WHICH PIPE AND FITTINGS ARE MANUFACTURED SHALL HAVE BEEN TESTED AND APPROVED FOR CONVEYING POTABLE WATER BY NSF INTERNATIONAL.
4. VALVES SHALL BE CLEARLY MARKED WITH THE MANUFACTURER'S NAME OR TRADEMARK, NOMINAL SIZE, MATERIAL DESIGNATION, ASTM D1970, COUNTRY OF ORIGIN, AND BARE THE NSF-PW-G (VERIFYING LISTINGS FOR CONVEYING POTABLE WATER, DEZINCIFICATION RESISTANT, AND LEAD-FREE).

BASKET STRAINER

1. SUPPLY AND INSTALL ONE 1" SB SIMPLEX BASKET STRAINER IN PVC WITH EPDM SEALS, SOCKET/THREADED ENDS, AND PVC 1/16" PERFORATION BASKET, OR APPROVED EQUAL. SECURE THE UNIT FIRMLY TO THE FLOOR.

FILTER CARTRIDGE HOUSING

1. SUPPLY AND INSTALL FOUR (4) BIG BLUE 20" WATER FILTER HOUSING BY PENTEK PART #150233, OR APPROVED EQUAL. MUST FIT 4-1/2" O. CARTRIDGES.

5-MICRON CARTRIDGE

1. SUPPLY AND INSTALL ONE (1) HB-20-5W 5-MICRON 20" CARTRIDGE 4-1/2" O.D SUITABLE FOR A 20" BIG BLUE FILTER HOUSING UP TO 26 GPM OR APPROVED EQUAL. PROVIDE TWO (2) ADDITIONAL FILTER CARTRIDGES AS SPARES.

1-MICRON ABSOLUTE CARTRIDGE

1. SUPPLY AND INSTALL ONE (1) WATERITE'S EXCELPUS + PLEATED POLYPROPYLENE SEDIMENT FILTER, 1 MICRON POLY PLEATED ABSOLUTE FILTER, PART #PLA20B01 FOR BIG BLUE 20" UP TO 25 GPM; OR APPROVED EQUAL. PROVIDE TWO (2) ADDITIONAL FILTER CARTRIDGES AS SPARES.

GAC CARTRIDGE

1. SUPPLY AND INSTALL TWO (2) VIQUA BIG BLUE-STYLE CARBON GAC FILTER CARTRIDGES (C2-02GAC) 4.5" X 20" UP TO 9 GPM, SUITABLE FOR A 4-1/2" O.D. SUITABLE FOR A 20" BIG BLUE FILTER HOUSING; OR APPROVED EQUAL. PROVIDE FOUR (4) ADDITIONAL FILTER CARTRIDGES AND SPARES.

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UV DISINFECTION SYSTEM

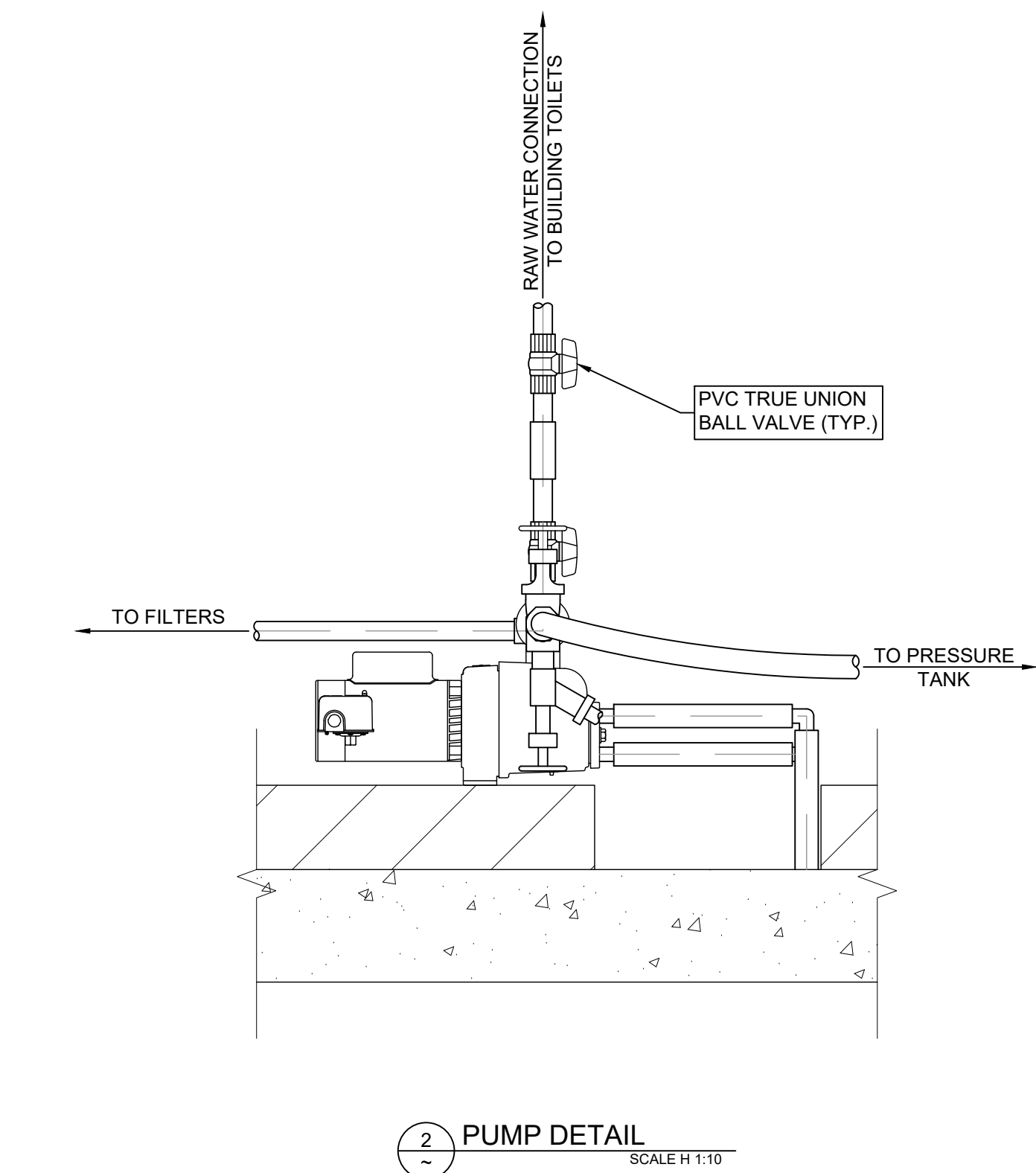
3. A UV CONTROLLER SHALL BE PROVIDED FOR START-UP FUNCTION. ONE SPARE SET OF UV BULBS PER UV UNIT SHALL BE PROVIDED IN A COMMON SINGLE RIGID, PELICAN PLASTIC CASE WITH INTERNAL FOAM PADDING MODIFIED TO THE MANUFACTURER'S RECOMMENDATIONS FOR BULB STORAGE AND MARKED "UV SPARE BULBS".
4. THE UV UNIT SHALL HAVE AN LCD READOUT, AUTOMATIC VISUAL ALARMS WITH AUTOMATIC SHUTDOWN.
5. INSTALL THE UV REACTOR IN COMPLIANCE WITH THE VIQUA PRO24-186 OWNER'S MANUAL (REFER TO SECTION 2.1 PAGE 6).
6. CONTRACTOR TO ENSURE THE UV FLOW SENSOR AND SOLENOID VALVE ARE SUPPLIED AND INSTALLED CORRECTLY AS PER THE VIQUA PRO24-186 OWNER'S MANUAL.
7. CONTRACTOR TO SUPPLY THE FOLLOWING UV SPARE PARTS: ONE (1) X PRO24-186 REPLACEMENT LAMP/SLEEVE COMBO PART #602850-103; ONE (1) EMERGENCY SOLENOID SHUT-OFF VALVE KIT PART #650627; ONE (1) PRO SERIES UV INTENSITY MONITOR SENSOR PART #650580.
8. ONCE THE CONTRACTOR HAS VERIFIED THE UV TRANSMISSIVITY OF THE TREATED WATER, THEY SHALL CONFIRM THAT THE INSTALLED FLOW RESTRICTOR MEETS THE REQUIREMENTS FOR UV SYSTEM VALIDATION. IF AN ALTERNATE FLOW RESTRICTOR IS REQUIRED TO ACHIEVE UV COMPLIANCE, THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROCUREMENT AND INSTALLATION OF THE ALTERNATE FLOW RESTRICTOR, ENSURING UV MEETS THE SPECIFIED PERFORMANCE CRITERIA.
9. THE CONTROL OF THE OVERALL WATER SYSTEM SHALL ALLOW SUFFICIENT UV LAMP WARM UP TIME IN ADVANCE OF WATER DISTRIBUTION TO END-USER.

2. MA STEWART G2 STAINLESS STEEL BALL VALVES SHALL BE USED FOR GAUGE ISOLATION.
3. ALL PIPE AND FITTINGS IN THE GAUGE ASSEMBLIES TO BE BRASS.

- SAFETY**
1. THE CONTRACTOR SHALL DESIGN THE FACILITY TO COMPLY WITH ALL APPLICABLE WORK SAFE BC STANDARDS, SUCH AS SIGNAGE, SAFETY GEAR, AND TRAINING.

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<p>0 2025-04-28 ISSUED FOR TENDER</p>						<p>GP CS CH</p>						<p>Project Number</p> <p>2341-21215-13</p>		<p>Rev.</p> <p>0</p>											
Rev	Date	Description	Drawn	Design	App'd																				

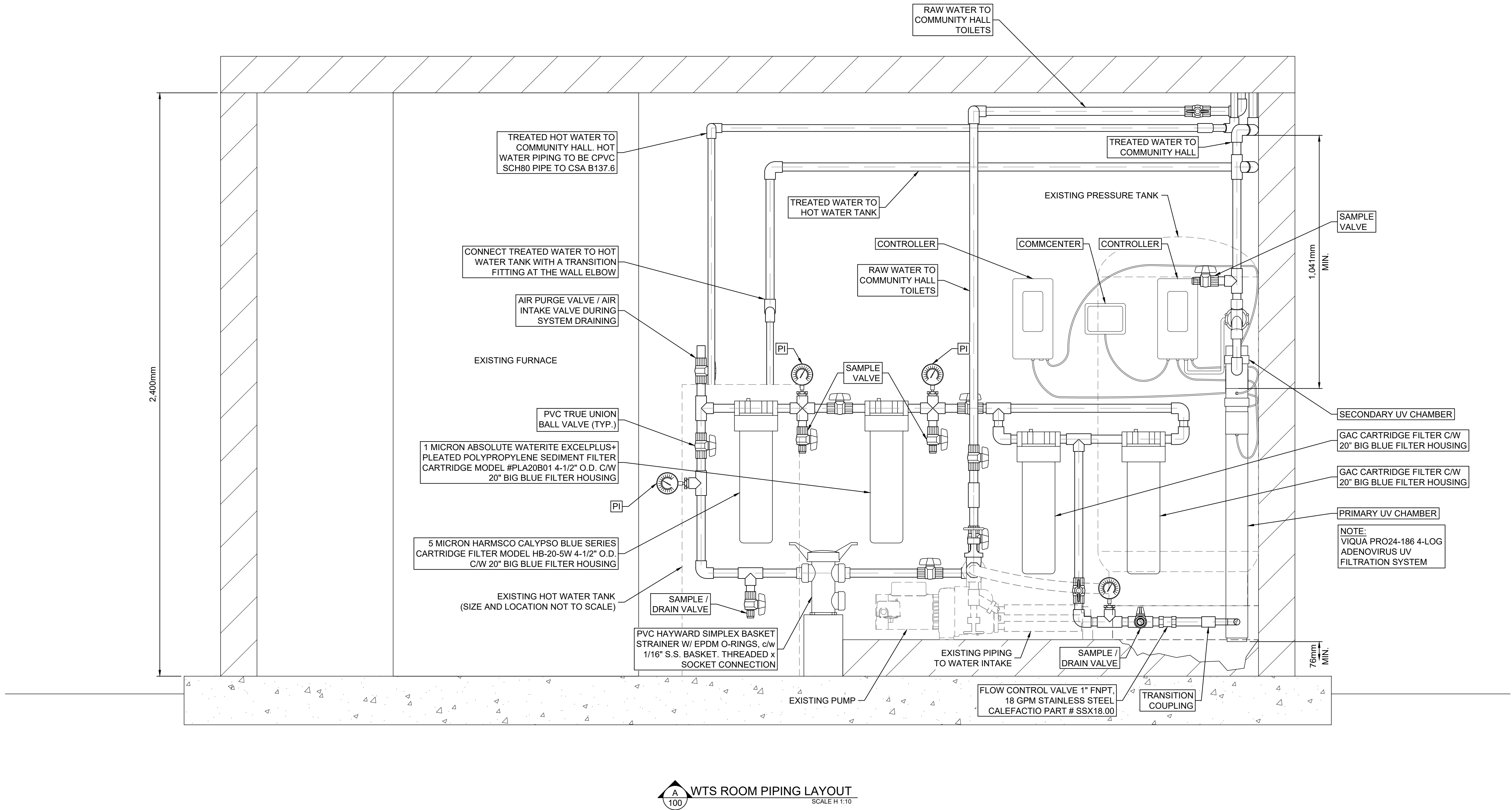


2 PUMP DETAIL
~ SCALE H 1:10

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ORIGINAL DWG SIZE: ANSI D (22" x 34")

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**NUKKO LAKE WATER TREATMENT SYSTEM
PIPING LAYOUT
SECTION VIEW A**

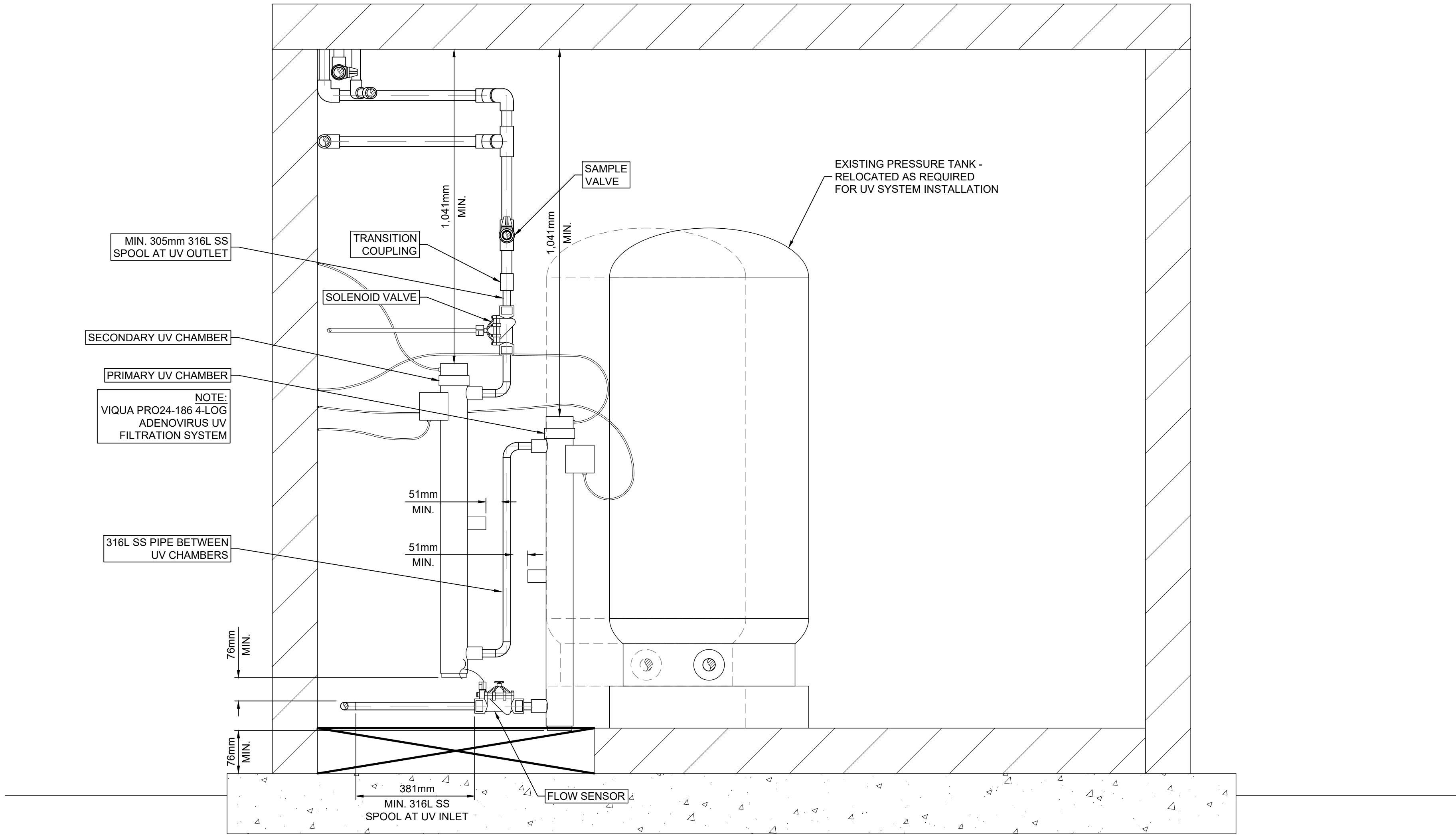
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C101

Project Number
2341-21215-13

Rev.
0

DESTROY ALL PRINTS BEARING PREVIOUS REVISION

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WTS ROOM PIPING LAYOUT
SCALE H 1:10

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NUKKO LAKE WATER TREATMENT SYSTEM
PIPING LAYOUT
SECTION VIEW B

Drawing No.
C102

Project Number
2341-21215-13

Rev.
0

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