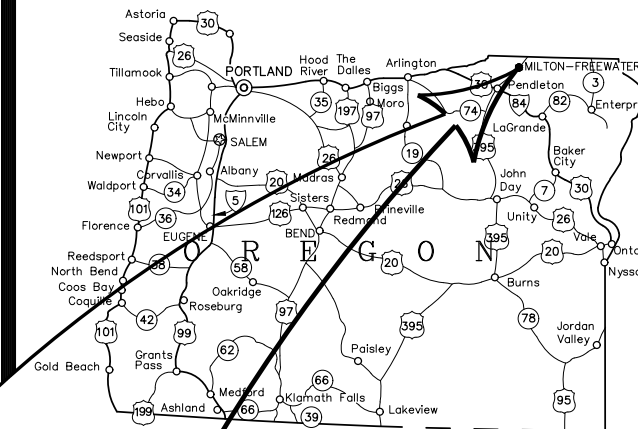


WALLA WALLA BASIN WATERSHED COUNCIL

CITY OF MILTON-FREEWATER WELL NO. 5 AQUIFER STORAGE AND RECOVERY DEMONSTRATION PROJECT

2018



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- 1 GENERAL ARRANGEMENT TRAILER, UF SKID (MEMCOR)

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- 11 UF BACKWASH PUMP
- 12 UF BACKWASH PUMP
- 13 SODIUM HYPOCHLORITE AND SULFURIC ACID
- 14 CITRIC ACID AND COAGULANT
- 15 UTILITIES
- 16 SCOUR AIR SYSTEM
- 17 CIP SYSTEM
- 18 PROCESS AIR

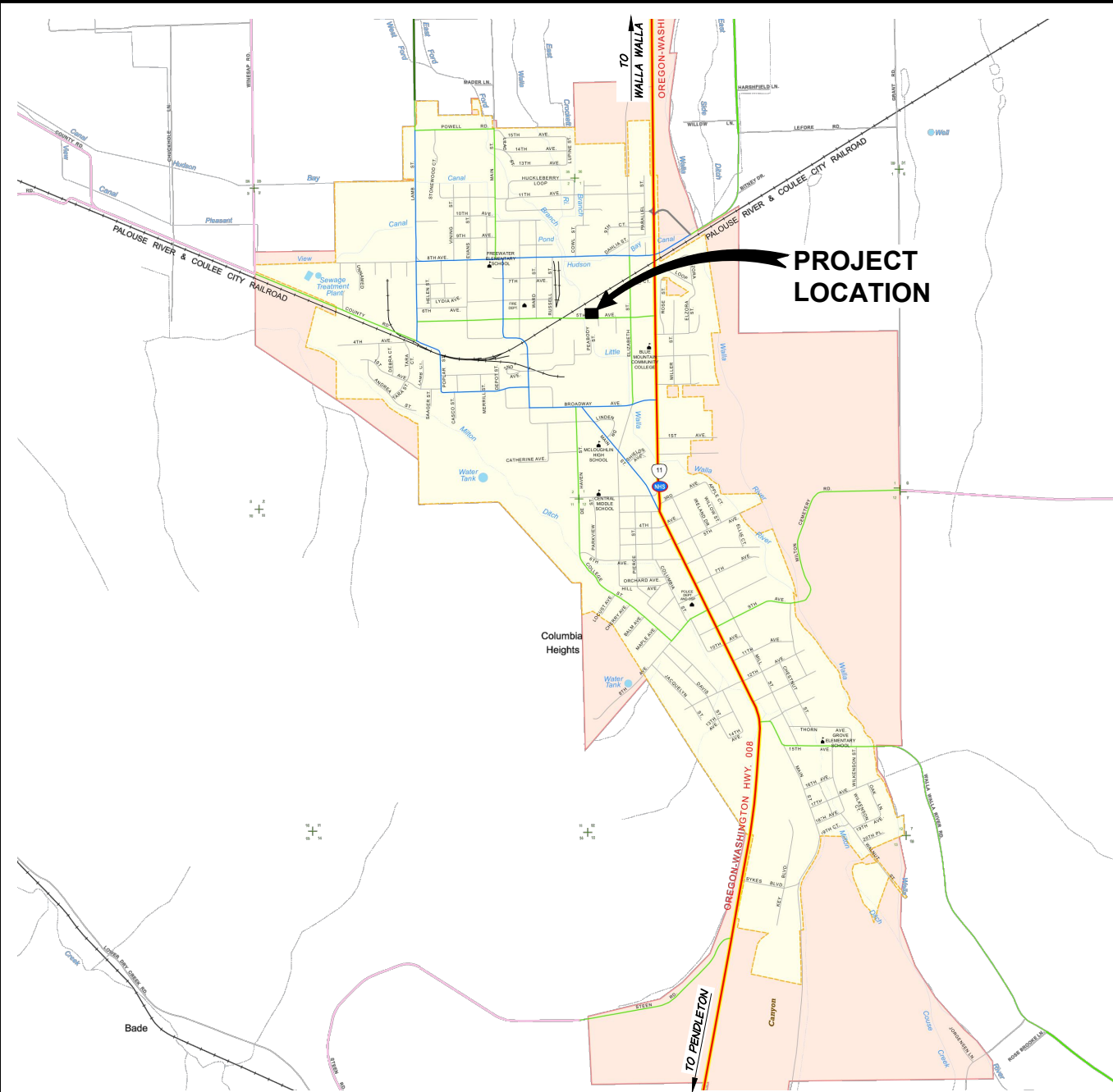
TROJAN UV INFORMATIONAL DRAWINGS - UV DISINFECTION UNIT

- D01 TROJANUVSWIFTSC D06 MODEL

SHEET

G-001

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VICINITY MAP
NTS

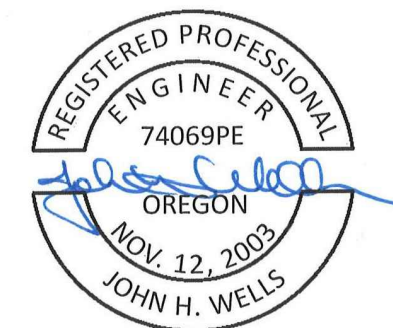


WALLA WALLA BASIN WATERSHED COUNCIL

Brian Wolcott - Executive Director
Marie Cobb - Senior Environmental Scientist

CITY OF MILTON-FREEWATER

Linda Hall - City Manager
Brian Steadman - Public Works Director
Steven Patten - Public Works Technician
Shane Wright - Water System Operator



RENEWS: 6-30-2020



214 E. Birch - Walla Walla, WA 99362 Ph: (509)529-9260 Fax: (509)529-8102
LA GRANDE, OR. WALLA WALLA, WA. REDMOND, OR. HERMISTON, OR.

GENERAL NOTES

1. THE PLANS, SPECIFICATIONS, AND REFERENCED DOCUMENTS SHALL BE USED TO CONSTRUCT THE IMPROVEMENTS SHOWN. REFERENCED DOCUMENTS INCLUDE THE OREGON DEPARTMENT OF TRANSPORTATION (ODOT) STANDARD SPECIFICATIONS FOR CONSTRUCTION (2018 EDITION), ODOT STANDARD DRAWINGS, AND THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD).
2. ALL EXISTING UTILITIES SHOWN ON THESE PLANS ARE SHOWN WITH AS MUCH ACCURACY AS POSSIBLE. IT SHOULD BE NOTED THAT SOME DISCREPANCIES AND OMISSIONS IN LOCATION, TYPE, AND SIZE WILL OCCUR AND THAT, IN GENERAL, ONLY MAIN UNDERGROUND UTILITIES ARE SHOWN EXCEPT FOR WATER AND SEWER SERVICES. UTILITIES SHOWN ARE FOR THE CONVENIENCE OF THE CONTRACTOR. THE CONTRACTOR SHALL FIELD LOCATE EXISTING UTILITIES, I.E. WATER, TELEPHONE, NATURAL GAS, SANITARY SEWER, STORM SEWER, ETC. AND ADJUST THE LOCATION OF THE NEW WATER LINES AS MAY BE NECESSARY TO PREVENT CONFLICTS WITH EXISTING WATER LINES OR OTHER UTILITIES. ALL ADJUSTMENTS SHALL BE REVIEWED AND APPROVED BY THE ENGINEER. THIS WORK SHALL BE PERFORMED PRIOR TO INSTALLING THE NEW WATER LINE TO ENSURE THE GRADE AND DEPTH OF NEW WATER LINE WILL NOT BE IN CONFLICT WITH THE EXISTING UTILITY AND TO ENSURE THAT THE MINIMUM DEPTH OF THE WATER LINE CAN BE MAINTAINED. THE CONTRACTOR SHALL PROVIDE FITTINGS AS REQUIRED TO ALLOW FOR A GRADE ADJUSTMENT OF THE NEW WATER LINE WHEN CONDITIONS REQUIRE. CONTRACTOR SHALL WORK CLOSELY WITH RESPECTIVE UTILITY COMPANIES FOR LOCATION AND COORDINATION NEEDS. (CALL - BEFORE - YOU - DIG 1-800-424-5555, UTILITIES NOTIFICATION CENTER).
2. THE CONTRACTOR SHALL DEVELOP A FORMAL WORK PLAN TO PROVIDE ADVANCE PUBLIC NOTIFICATION OF WATER UTILITY SERVICE INTERRUPTION CAUSED BY THE CONTRACTOR'S OPERATIONS. CONTRACTOR MUST MAINTAIN ACCESS FOR EMERGENCY VEHICLES AT ALL TIMES.
3. LOCATIONS OF REQUIRED TEES, CROSSES, VALVES, HYDRANTS, WATER METERS, ETC. SHOWN ON THE PLANS ARE APPROXIMATE ONLY. ACTUAL FIELD CONDITIONS WILL DETERMINE EXACT LOCATIONS.
4. THE WATER LINE DETAILS ON THESE SHEETS ARE SCHEMATIC IN NATURE. THE CONTRACTOR SHALL INSTALL THE LINES AS MAY BE REQUIRED IN THE FIELD AND AS APPROVED BY THE ENGINEER. THE CONTRACTOR MAY PROPOSE ALTERNATE COMBINATION OF FITTINGS.

PLAN LEGEND

WATER

- 10" W ——— EXISTING WATER LINE TYPE AND SIZE
- 10" RW ——— RAW WATER LINE AND SIZE
- ⊠ EXISTING VALVE
- ⊞ EXISTING WATER METER
- - - - - EDGE OF GRAVEL
- EDGE OF PAVEMENT

SEWER/STORM DRAIN

- - - - - 8" ss — EXISTING GRAVITY SEWER LINE AND SIZE
- IS — IS — EXISTING INDUSTRIAL SEWER LINE
- — 24" CMP — □ EXISTING CULVERT AND SIZE
- NEW MANHOLE

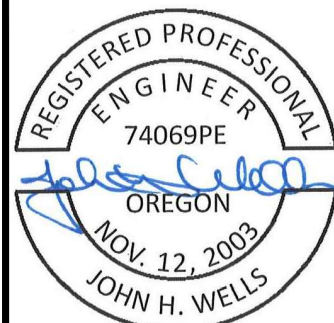
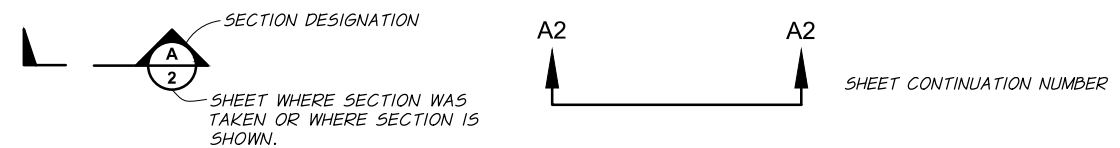
GENERAL

- - - - - EXISTING DITCH C/L AND FLOW
- x - x - NEW PERMANENT FENCELINE/GATE
- □ - □ - TEMPORARY CHAIN LINK FENCE
- ▭ EXISTING PAVED ROAD
- ▭ EXISTING BUILDING
- ⊙ EXISTING DECIDUOUS TREE

SITE SURVEY

- 3160 ——— EXISTING INDEX CONTOUR
- — — — — EXISTING INTERMEDIATE CONTOUR
- △ EXISTING PROPERTY PIN
- — ○ — EXISTING UTILITY POLE (WITH GUY)
- — ○ — EXISTING POWER POLE
- - - - - RIGHT-OF-WAY LINE OR PROPERTY LINE

DRAFTING



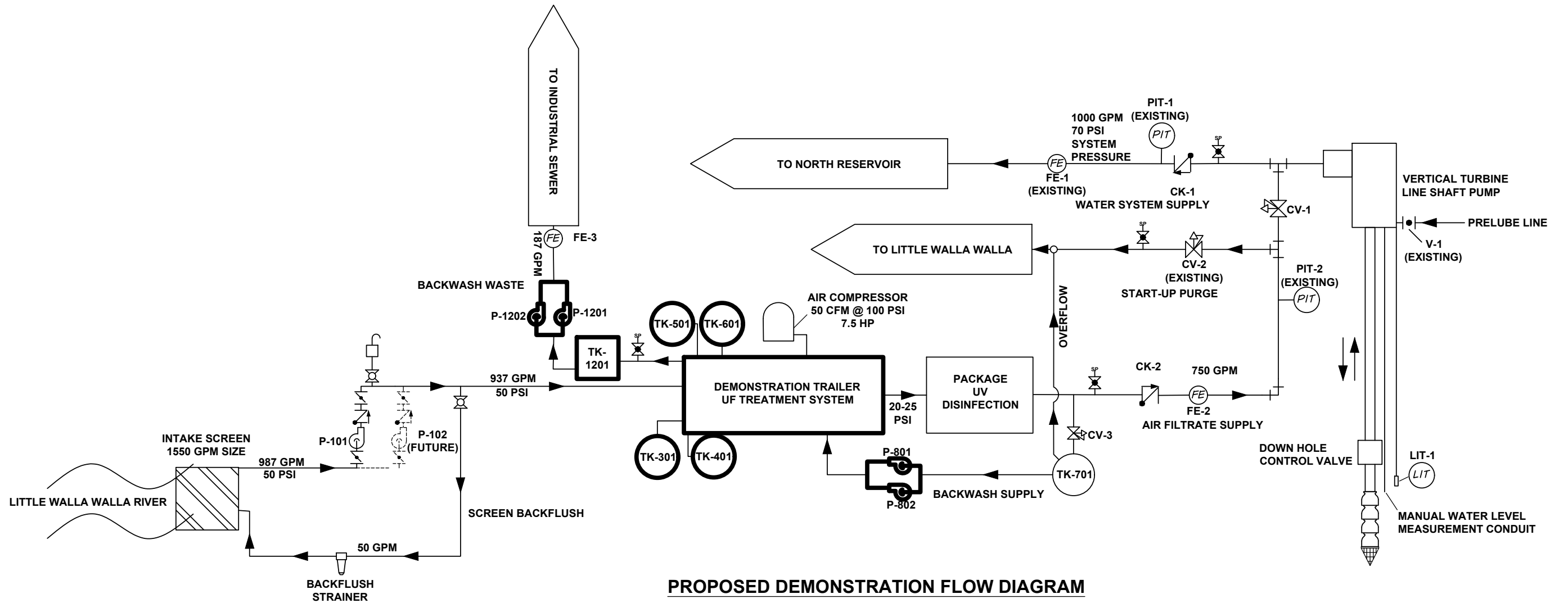
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WALLA WALLA BASIN WATERSHED COUNCIL
CITY OF MILTON-FREEWATER WELL NO. 5
AQUIFER STORAGE AND RECOVERY DEMONSTRATION PROJECT

GENERAL NOTES AND PLAN LEGEND



PROPOSED DEMONSTRATION FLOW DIAGRAM

NOTES:

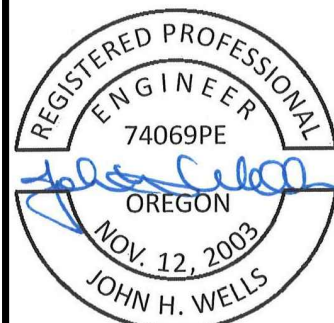
- 1) CITY TO PROVIDE POWER TO:
 - A. INFEED PUMPS
 - B. AIR COMPRESSOR
 - C. UV SYSTEM
 - D. UF TRAILER/SYSTEM
- 2) THE UF TRAILER SHALL PROVIDE POWER FOR ALL AUXILIARY EQUIPMENT EXCEPT A, B, AND C UNDER NOTE 1 ABOVE.
- 3) DEMONSTRATION PROJECT INTAKE FLOW RATE=987 GPM
FULL BUILD-OUT INTAKE FLOW RATE=1550 GPM
- 4) UF TRAILER/SYSTEM RENTAL COMPONENTS IN BOLD.

LEGEND

- TURBINE PUMP
- CENTRIFUGAL PUMP
- CHECK VALVE
- CONTROL VALVE
- FLOWMETER
- SAMPLING PORT
- BUTTERFLY VALVE
- BALL VALVE
- COMBINATION AIR/VAC RELEASE VALVE

SYSTEM COMPONENTS			
ID	DESCRIPTION	SIZE	ELECTRICAL REQUIREMENTS
CONTROL VALVES			
CV-1	PRESSURE RELIEF/ ON & OFF, ANGLED	12" INLET, 12" OUTLET	120V AC
CV-2	PRESSURE RELIEF/ ON & OFF, ANGLED	4" INLET, 4" OUTLET	120V AC
CV-3	PRESSURE SUSTAINING/ ALTITUDE, GLOBE	4" INLET, 4" OUTLET	N/A
FLOW METERS			
FE-1	EXISTING WATER SUPPLY TO RESERVOIR	12" DIA	4-20 MA; PULSE COUNTER
FE-2	NEW DEMONSTRATION ASR WATER SUPPLY	8" DIA	4-20 MA; PULSE COUNTER
FE-3	NEW BACKWASH WASTE	4" DIA	4-20 MA; PULSE COUNTER
INSTRUMENTATION			
PIT-1	PRESSURE TRANSDUCER - RESERVOIR DISCHARGE	1/4"	24V DC
PIT-2	PRESSURE TRANSDUCER - RECHARGE SYSTEM	1/4"	24V DC
LIT-1	LEVEL TRANSDUCER - WELL WATER DEPTH	3/4"	24V DC
V-1	SOLENOID VALVE	1"	120V AC

SYSTEM COMPONENTS			
ID	DESCRIPTION	SIZE	CAPACITY
INFEED SYSTEM			
P-101	INFEED PUMP 1, VFD	50 HP/1785 RPM	1200 GPM
P-102	INFEED PUMP 2 (FUTURE)	50 HP/1785 RPM	1200 GPM
FILTERED WATER STORAGE			
TK-701	FILTERED WATER STORAGE TANK	43'L X 10.5'W	21,000 GALLON
BACKWASH SYSTEM			
P-801	UF FILTRATE BACKWASH FEED PUMP 1	VFD, 25 HP/3600 RPM	550 GMP @ 30 PSI
P-802	UF FILTRATE BACKWASH FEED PUMP 2	VFD, 7.5 HP/3600 RPM	187 GPM @ 34 PSI
P-1201	UF BASKWASH WASTE PUMP 1	VFD, 7.5 HP/3600 RPM	187 GPM @ 34 PSI
P-1202	UF BASKWASH WASTE PUMP 2	VFD, 7.5 HP/3600 RPM	187 GPM @ 34 PSI
TK-1201	BACKWASH WASTE TANK	128"L X 84"W X 42"H	1,600 GALLON
TK-301	SODIUM HYPOCHLORITE STORAGE TANK		
TK-401	SULFURIC ACID STORAGE TANK		
TK-501	CITRIC ACID STORAGE TANK		
TK-601	COAGULANT STORAGE TANK		



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AQUIFER STORAGE AND RECOVERY DEMONSTRATION PROJECT

FLOW DIAGRAM

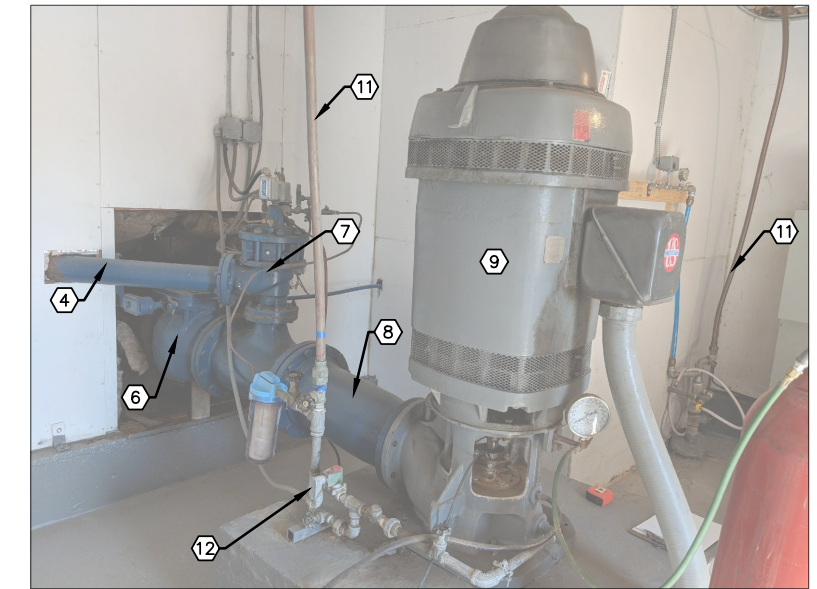
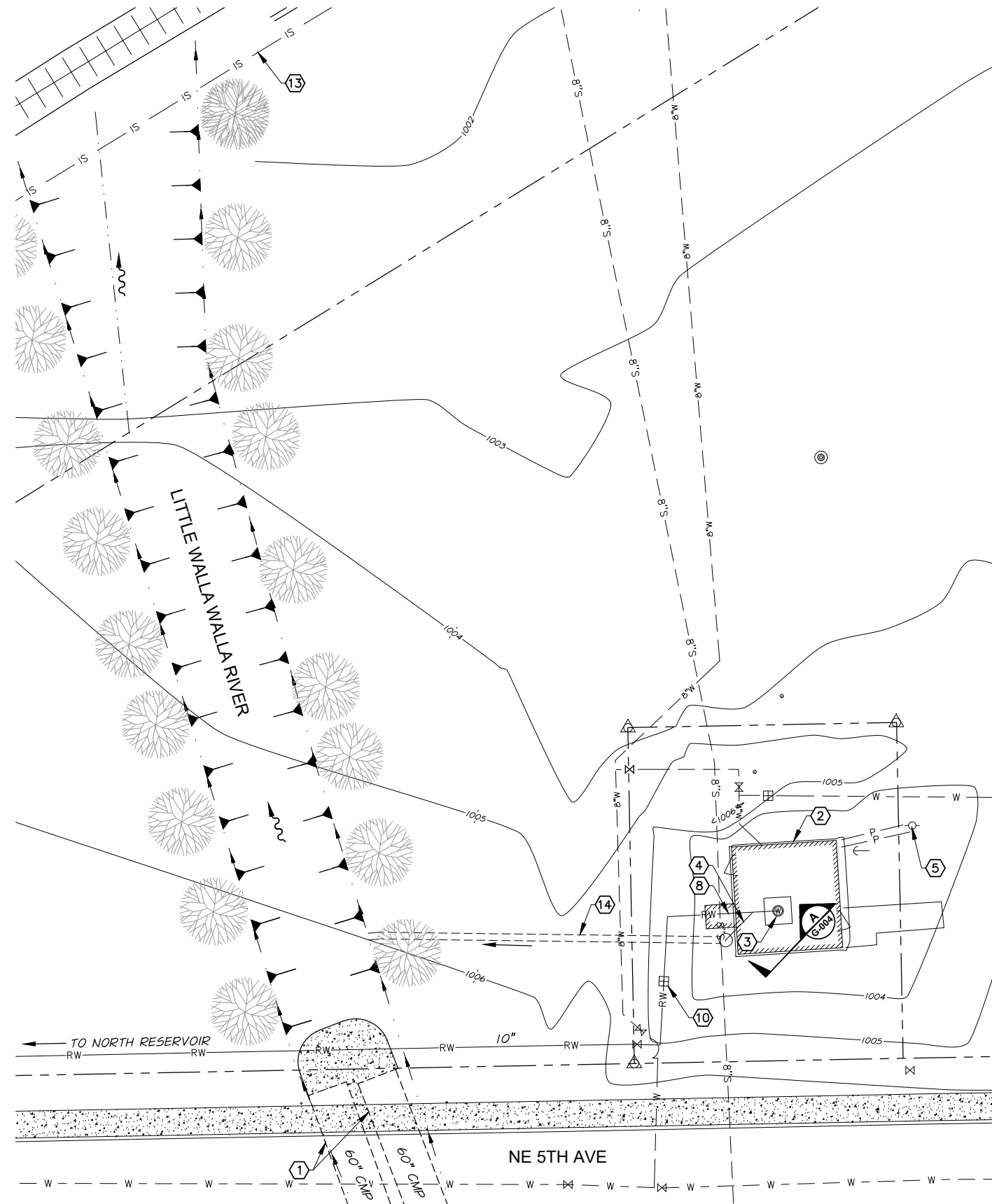
SHEET

G-003

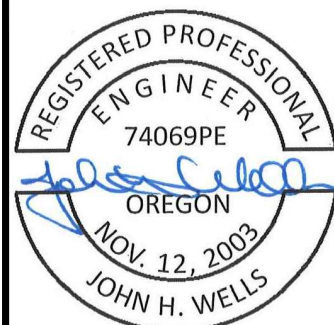
3 OF 14

KEY NOTES:

- ① 60" DIAMETER CULVERT
- ② WELL NO. 5 WELL HOUSE
- ③ WELL NO. 5
- ④ 4" DIAMETER D.I. WELDED STEEL PUMP-TO-WASTE LINE
- ⑤ SITE POWER SUPPLY
- ⑥ EXISTING 12" SWING CHECK VALVE
- ⑦ EXISTING 4" PUMP-TO-WASTE CONTROL VALVE
- ⑧ 12" DIAMETER D.I. WELDED STEEL PIPE SPOOL DISCHARGE PIPE
- ⑨ EXISTING VERTICAL TURBINE LINE SHAFT PUMP
- ⑩ FLOW METER IN VAULT
- ⑪ 1" COPPER PRE-LUBE LINE
- ⑫ WELL PRE-LUBE SOLENOID VALVE
- ⑬ ASSUMED LOCATION OF EXISTING INDUSTRIAL SEWER. SIZE, CONDITION AND EXACT LOCATION ARE UNKNOWN. CITY TO VERIFY SIZE, MATERIAL, CONDITION, AND LOCATION PRIOR TO CONSTRUCTION.
- ⑭ EXISTING 12" CMP, LITTLE WALLA WALLA RIVER RETURN CULVERT.



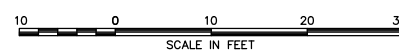
A
G-004 N.T.S.
EXISTING WELL HOUSE PIPING



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EXISTING SITE PLAN

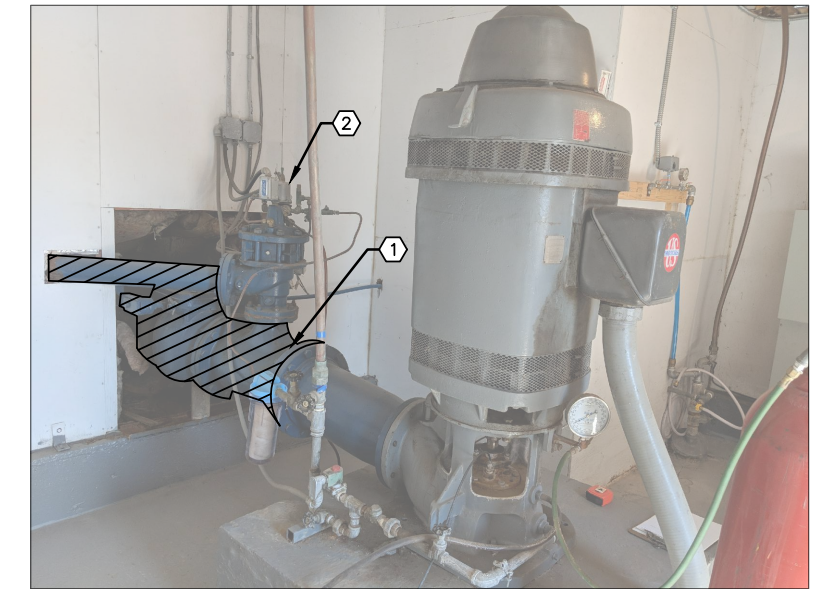
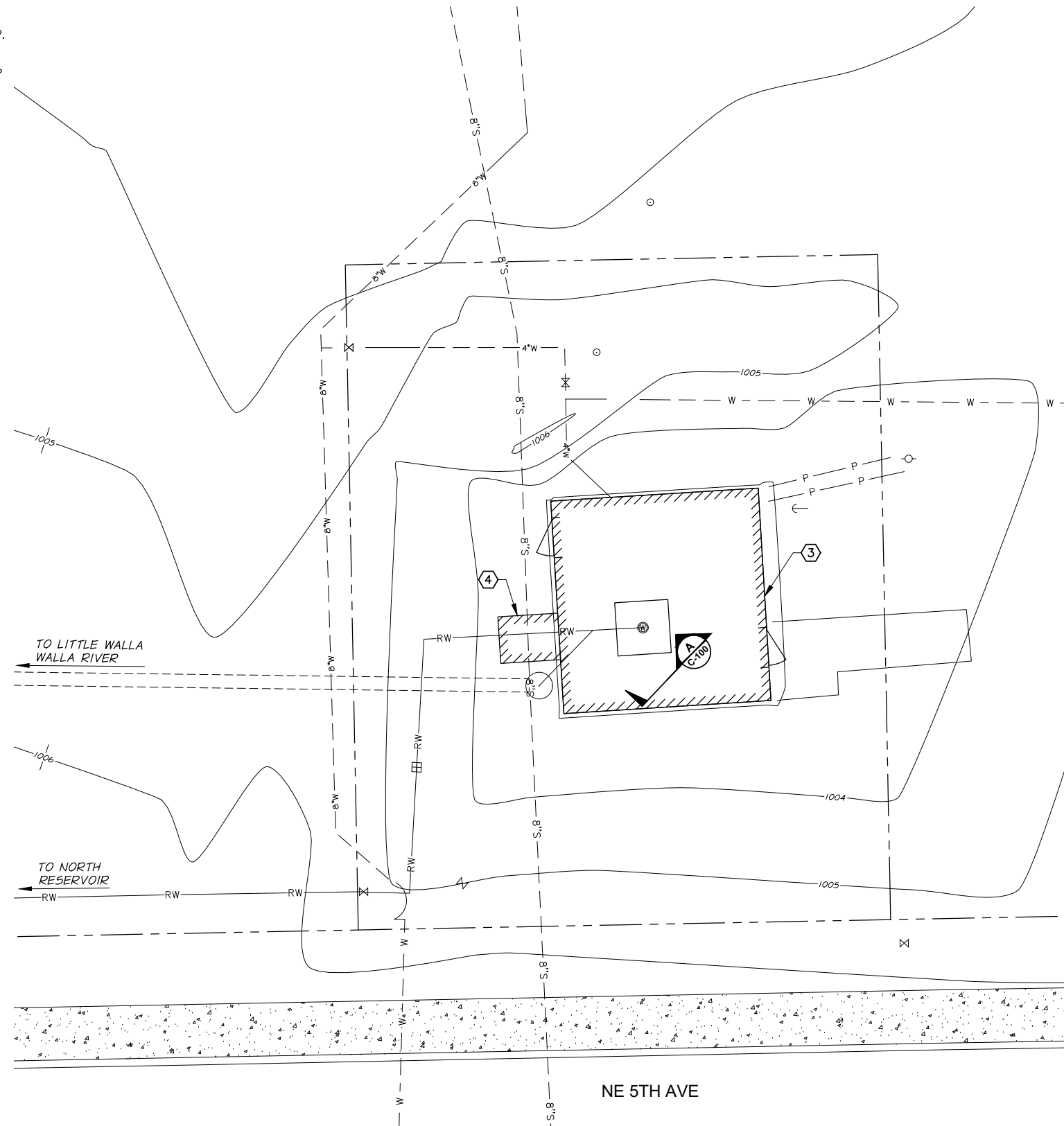
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G-004

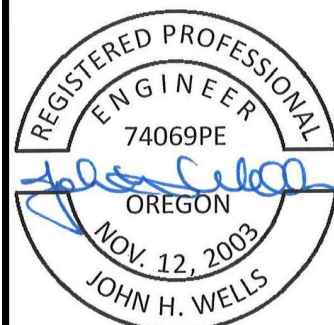
4 OF 14

KEY NOTES:

- ① REMOVE EXISTING COMPONENTS. SEE COMPONENT DESCRIPTIONS ON G-004.
- ② SALVAGE EXISTING CONTROL VALVE. TO BE USED AS CV-2.
- ③ SALVAGE AND RELOCATE EXISTING BUILDING ENCLOSURE PRIOR TO INSTALLING DOWN HOLE WELL VALVE AND WATER LEVEL INSTRUMENTATION. AFTER COMPLETION OF WELL IMPROVEMENTS, EXISTING BUILDING TO BE RE-INSTALLED TO EQUAL OR BETTER PRE-CONSTRUCTION CONDITION.
- ④ REMOVE EXISTING LEAN-TO STRUCTURE.



A WELL HOUSE DEMOLITION
C-100 N.T.S.

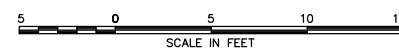


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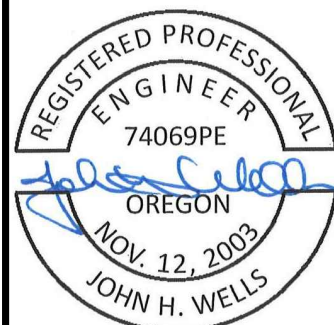
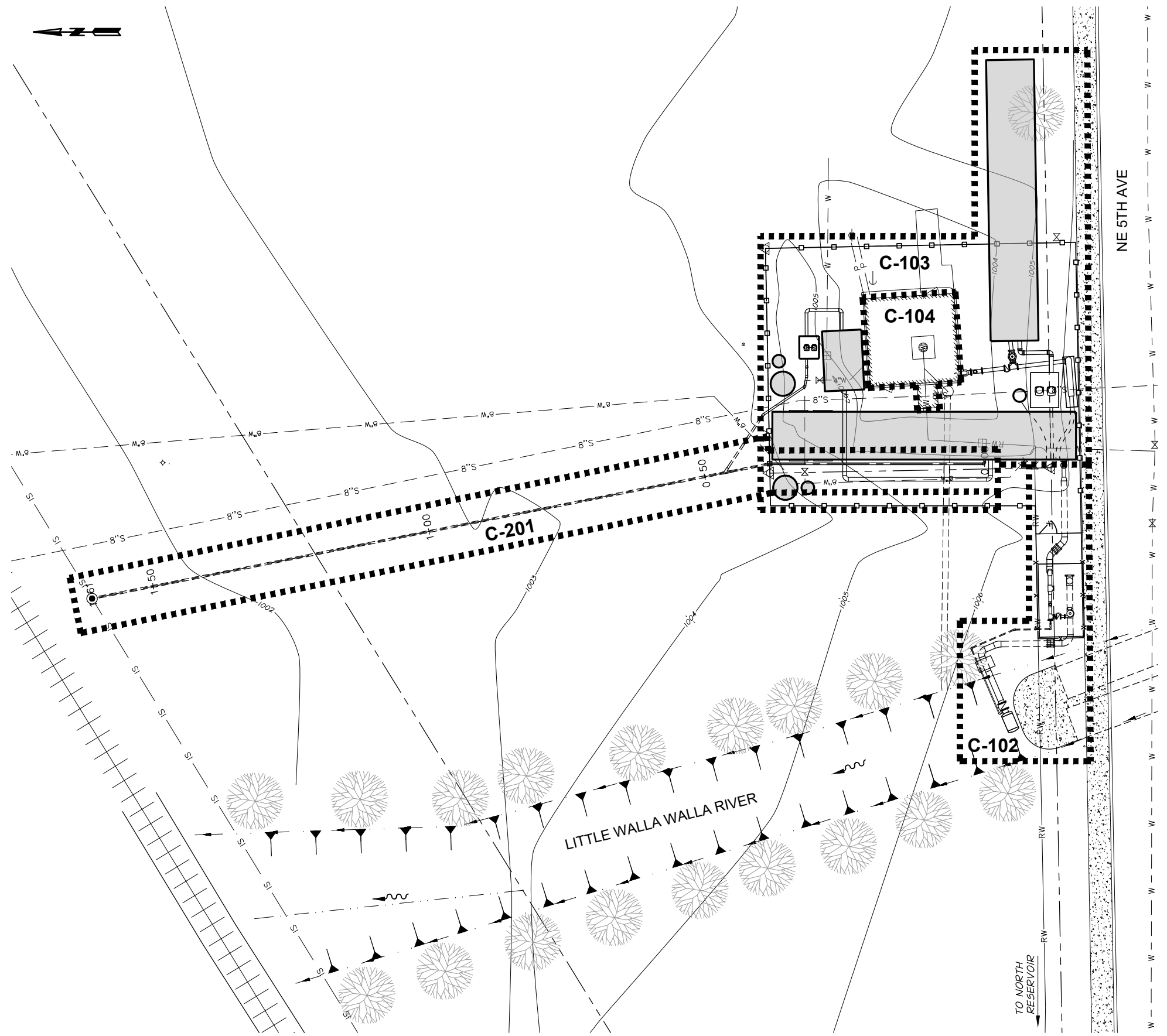
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 CITY OF MILTON-FREEWATER WELL NO. 5
 AQUIFER STORAGE AND RECOVERY DEMONSTRATION PROJECT

DEMOLITION PLAN

SHEET
C-100
 5 OF 14



RENEWS: 6-30-2020

REVISION	BY	DATE

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DRAWN BY *J. CHAPMAN*
REVIEWED BY *J. WELLS*

<p>SCALE IN FEET</p>	
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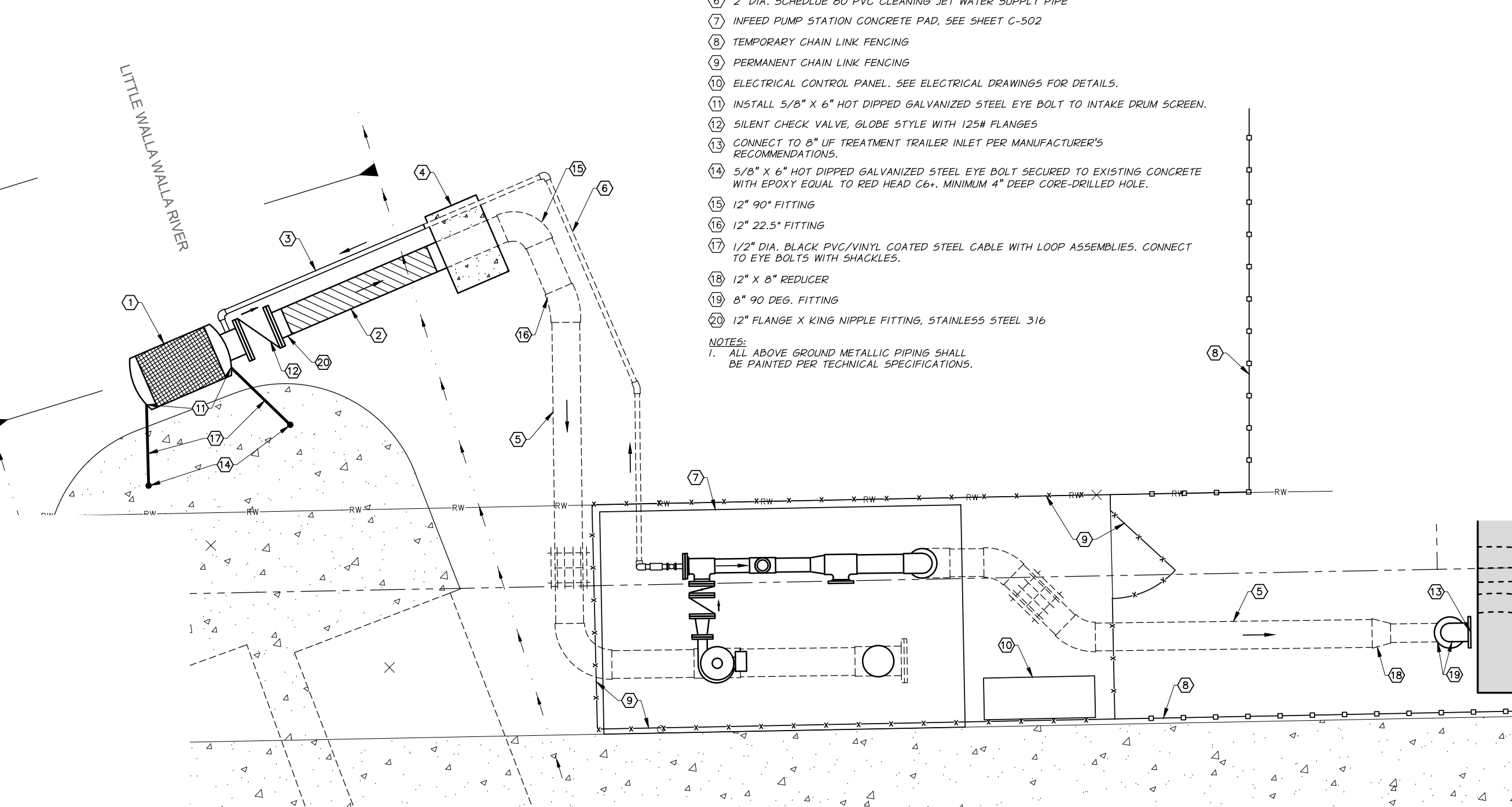
PROPOSED SITE PLAN

SHEET
C-101
6 OF 14

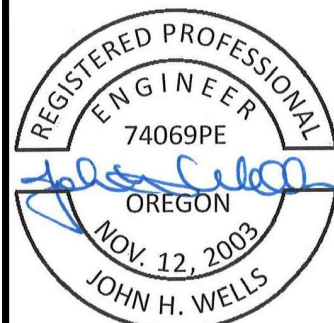
KEY NOTES:

- ① INTAKE DRUM SCREEN, SEE DETAIL SHEET C-501.
- ② 12" DIA. CLEAR FLEXIBLE PVC CORRUGATED SUCTION HOSE
- ③ 1.5" DIA. BRAIDED EPDM RUBBER DISCHARGE HOSE
- ④ SUCTION INTAKE CONNECTIONS, SEE SHEET C-501 FOR DETAILS
- ⑤ 12" DIA. STEEL MANIFOLD WITH FITTINGS AS SHOWN
- ⑥ 2" DIA. SCHEDULE 80 PVC CLEANING JET WATER SUPPLY PIPE
- ⑦ INFEEED PUMP STATION CONCRETE PAD, SEE SHEET C-502
- ⑧ TEMPORARY CHAIN LINK FENCING
- ⑨ PERMANENT CHAIN LINK FENCING
- ⑩ ELECTRICAL CONTROL PANEL. SEE ELECTRICAL DRAWINGS FOR DETAILS.
- ⑪ INSTALL 5/8" X 6" HOT DIPPED GALVANIZED STEEL EYE BOLT TO INTAKE DRUM SCREEN.
- ⑫ SILENT CHECK VALVE, GLOBE STYLE WITH 125# FLANGES
- ⑬ CONNECT TO 8" UF TREATMENT TRAILER INLET PER MANUFACTURER'S RECOMMENDATIONS.
- ⑭ 5/8" X 6" HOT DIPPED GALVANIZED STEEL EYE BOLT SECURED TO EXISTING CONCRETE WITH EPOXY EQUAL TO RED HEAD C6+. MINIMUM 4" DEEP CORE-DRILLED HOLE.
- ⑮ 12" 90° FITTING
- ⑯ 12" 22.5° FITTING
- ⑰ 1/2" DIA. BLACK PVC/VINYL COATED STEEL CABLE WITH LOOP ASSEMBLIES. CONNECT TO EYE BOLTS WITH SHACKLES.
- ⑱ 12" X 8" REDUCER
- ⑲ 8" 90 DEG. FITTING
- ⑳ 12" FLANGE X KING NIPPLE FITTING, STAINLESS STEEL 316

NOTES:
 1. ALL ABOVE GROUND METALLIC PIPING SHALL BE PAINTED PER TECHNICAL SPECIFICATIONS.

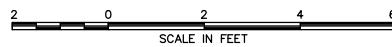


1 RIVER INTAKE SITE PLAN
 C-102



RENEWS: 6-30-2020

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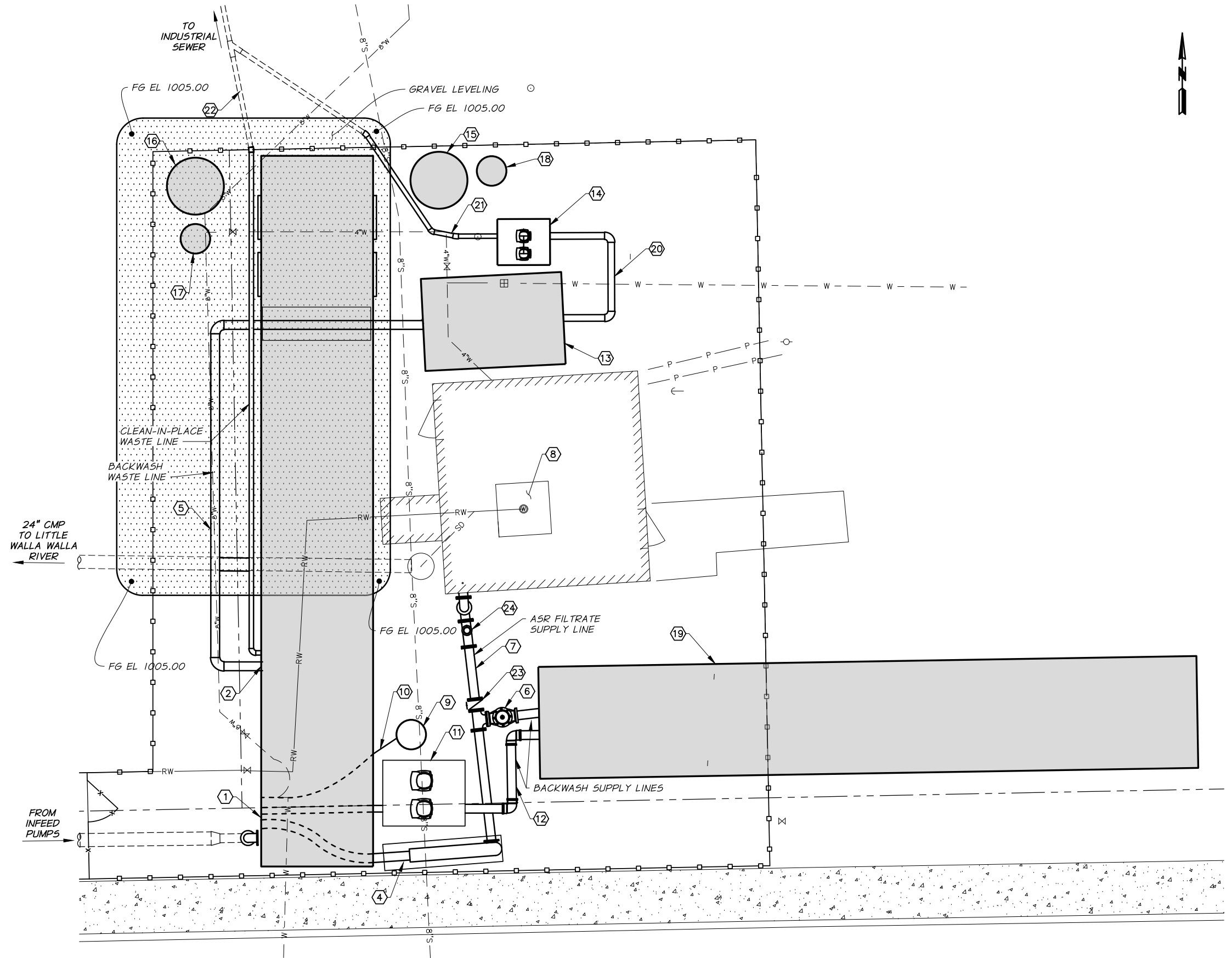
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 AQUIFER STORAGE AND RECOVERY DEMONSTRATION PROJECT

RIVER INTAKE SITE PLAN

KEY NOTES:

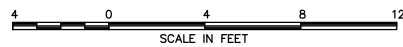
- ① UF TREATMENT TRAILER RAW WATER INLET, FILTRATE OUTLET, BACKWASH SUPPLY INLET, AND AIR SUPPLY INLET. SEE GENERAL ARRANGEMENT TRAILER DRAWING.
- ② UF TREATMENT TRAILER WASTE OUTLETS. SEE GENERAL ARRANGEMENT TRAILER DRAWING.
- ③ UF TREATMENT SYSTEM TRAILER.
- ④ UV DISINFECTION TREATMENT SKID.
- ⑤ 8" SCHEDULE 80 PVC BACKWASH WASTE PIPE.
- ⑥ ALTITUDE VALVE CV-3
- ⑦ FILTRATE LINE TO WELL NO. 5.
- ⑧ WELL HEAD IMPROVEMENTS, SEE SHEETS C-104 AND C-105.
- ⑨ AIR COMPRESSOR.
- ⑩ AIR LINE.
- ⑪ BACKWASH SUPPLY PUMPS AND SKID.
- ⑫ BACKWASH SUPPLY LINE.
- ⑬ BACKWASH WASTE STORAGE TANK (TK-1201).
- ⑭ BACKWASH WASTE STORAGE PUMPS AND SKID (P-1201 & P-1202).
- ⑮ SODIUM HYPOCHLORITE STORAGE TANK (TK-301).
- ⑯ COAGULANT STORAGE TANK (TK-501).
- ⑰ CITRIC ACID STORAGE TANK (TK-601).
- ⑱ SULFURIC ACID STORAGE DRUM (TK-401).
- ⑲ FILTERED WATER STORAGE TANK (TK-701).
- ⑳ 6" SCHEDULE 80 PVC BACKWASH WASTE PIPE.
- ㉑ 4" SCHEDULE 80 PVC WASTE PIPE.
- ㉒ 6" SDR 35 PVC WASTE PIPE.
- ㉓ 8" CHECK VALVE.
- ㉔ 8" FLOWMETER.
- ㉕ HEAT TAPE, 3W/FT 120 VOLT SELF REGULATING HEATING CABLE WITH THERMOPLASTIC ELASTOMER JACKET.

NOTES:
 1. ALL ABOVE GROUND METALLIC PIPING SHALL BE PAINTED PER TECHNICAL SPECIFICATIONS.



RENEWS: 6-30-2020

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 AQUIFER STORAGE AND RECOVERY DEMONSTRATION PROJECT

DEMONSTRATION TREATMENT TRAILER SITE PLAN

SHEET

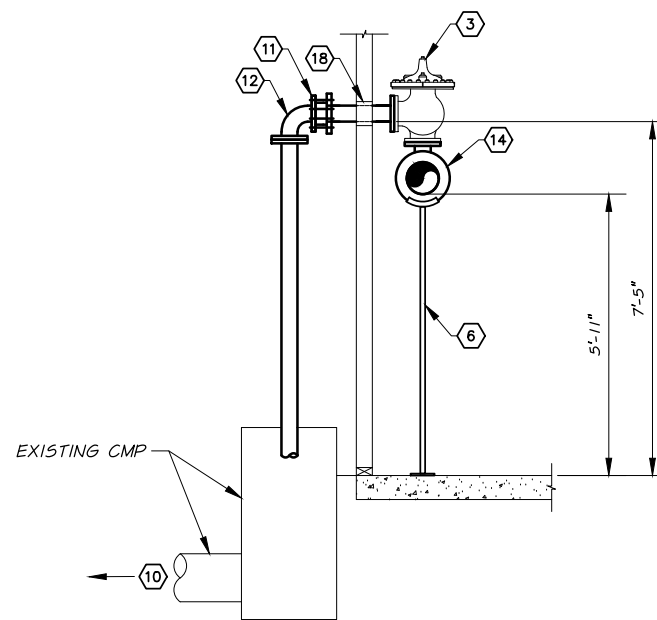
C-103

8 OF 14

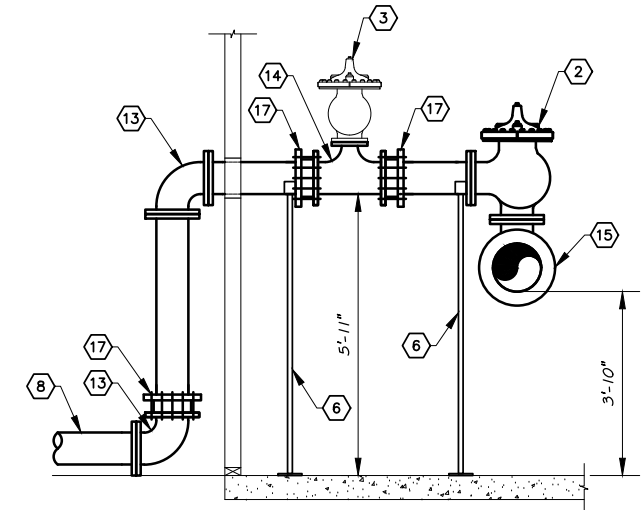
KEY NOTES

- ① 12" SWING CHECK VALVE.
- ② 8" CONTROL VALVE, ANGLED.
- ③ SALVAGED 4" CONTROL VALVE, ANGLED.
- ④ EXISTING WELL NO. 5 VERTICAL LINE SHAFT TURBINE PUMP.
- ⑤ RESERVED
- ⑥ PIPE SUPPORT, SEE SHEET C-502 FOR DETAILS.
- ⑦ WELL NO. 5.
- ⑧ ASR FILTRATE SUPPLY FROM UF TREATMENT TRAILER.
- ⑨ CONNECT TO EXISTING PIPE SERVING NORTHERN RESERVOIR. FIELD FABRICATE AS NECESSARY.
- ⑩ TO 12" DIA. STORM DRAIN AND LITTLE WALLA WALLA RIVER DISCHARGE.
- ⑪ 4" FLG COUPLING ADAPTOR.
- ⑫ 4" FLG 90° BEND.
- ⑬ 8" FLG 90 DEG. FITTING
- ⑭ 8"x4" FLG TEE.
- ⑮ 12"x8" FLG TEE.
- ⑯ 12" FLG 90° BEND.
- ⑰ 8" FLG COUPLING ADAPTOR.
- ⑱ INSTALL NEW PIPE WALL PENETRATION AND PROVIDE WEATHER TIGHT FINISH.
- ⑲ 12" MJ 90° BEND.
- ⑳ NEW ELECTRICAL CONTROL PANEL.
- ㉑ PRESSURE TRANSDUCER.
- ㉒ NEW EXTENDED ALL WEATHER ENCLOSURE.
- ㉓ EXISTING ELECTRICAL CONTROL PANEL.
- ㉔ DOWN HOLE WELL CONTROL VALVE HYDRAULIC LINES AND PRESSURE TRANSDUCER WIRING.
- ㉕ 12" FLG COUPLING ADAPTOR.

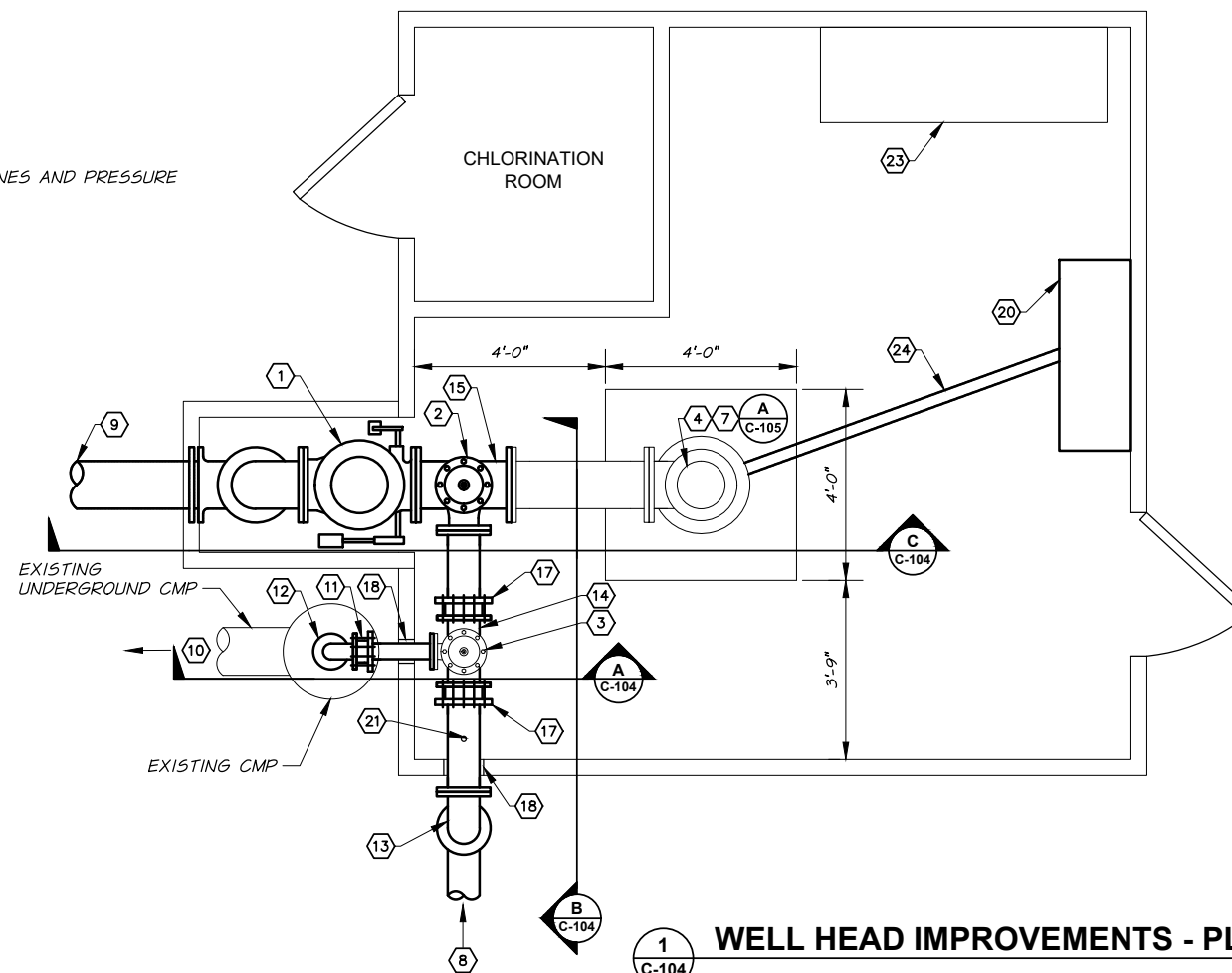
NOTES:
 1. ALL ABOVE GROUND METALLIC PIPING SHALL BE PAINTED PER TECHNICAL SPECIFICATIONS.



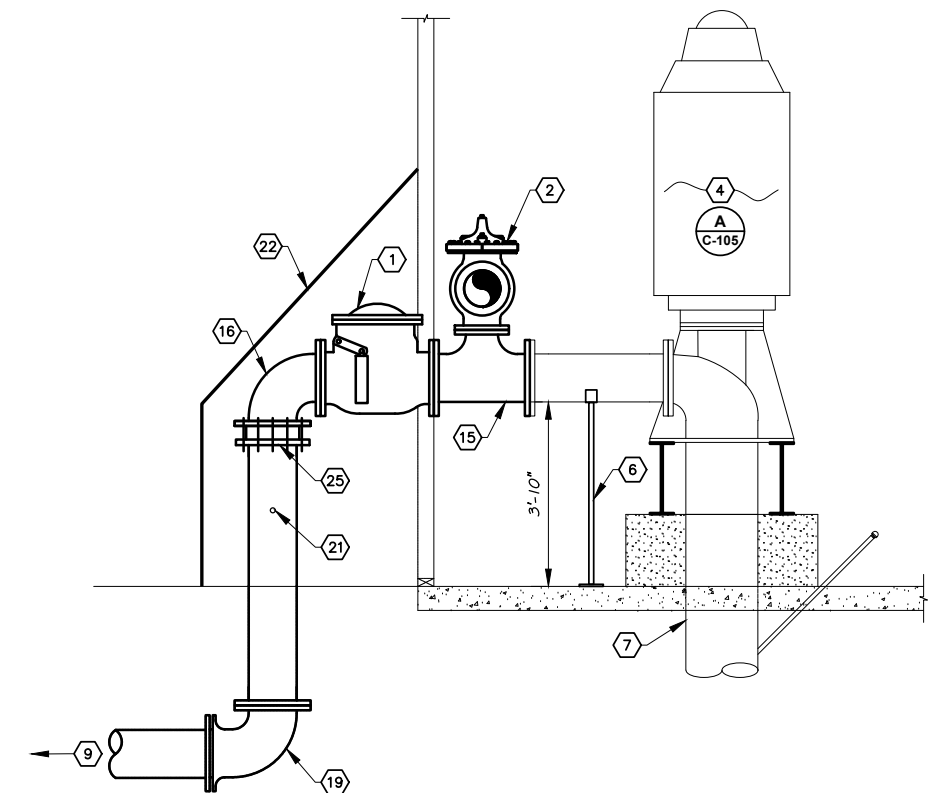
A WELL HEAD IMPROVEMENTS - SECTION A
 C-104



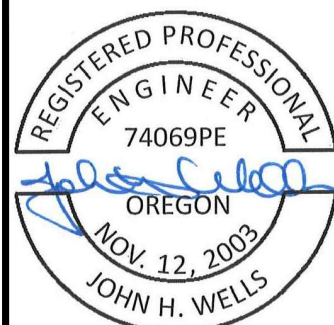
B WELL HEAD IMPROVEMENTS - SECTION B
 C-104



1 WELL HEAD IMPROVEMENTS - PLAN
 C-104

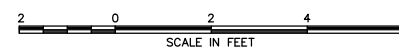


C WELL HEAD IMPROVEMENTS - SECTION C
 C-104



RENEWS: 6-30-2020

REVISION	BY	DATE	JOB NUMBER 7008-625	DATE November 5, 2018
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 AQUIFER STORAGE AND RECOVERY DEMONSTRATION PROJECT

WELL HEAD IMPROVEMENTS I

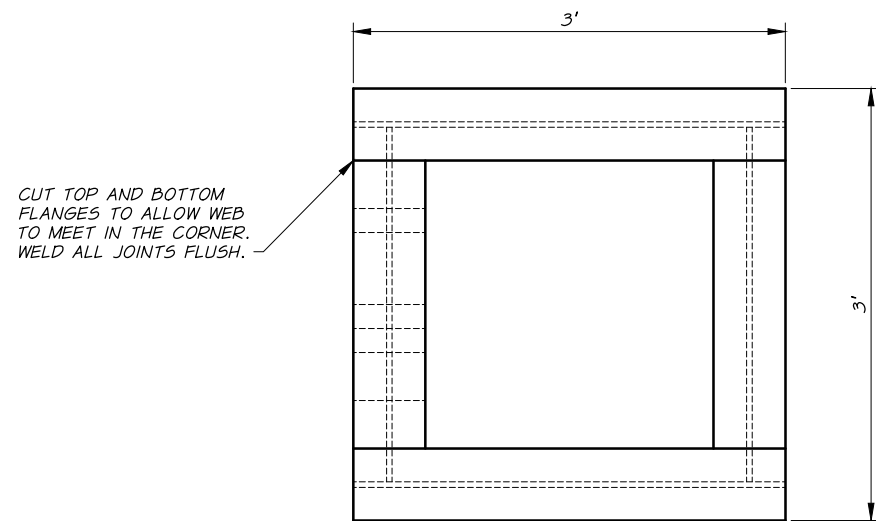
SHEET

C-104

9 OF 14

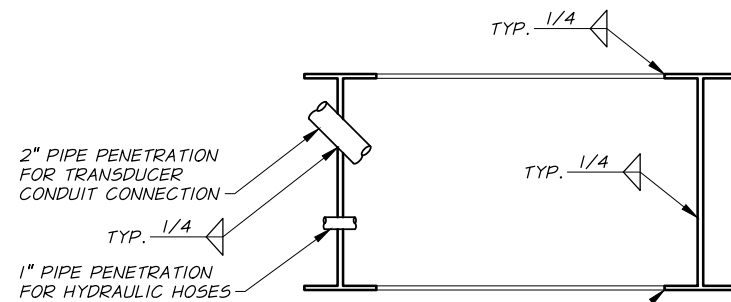
KEY NOTES

- ① EXISTING TURBINE PUMP.
- ② 18" PUMP BASE FABRICATED STRUCTURAL STEEL W18X40, EPOXY COATED.
- ③ TWO 1/4" DIA. HYDRAULIC LINES.
- ④ 1" DIA. AIR LINE.
- ⑤ EXISTING 1" ACCESS PORT.
- ⑥ REAM EXISTING PENETRATION.
- ⑦ 18" STEEL CASING.
- ⑧ 1 1/2" SCHEDULE 40 PVC TRANSDUCER CONDUIT.
- ⑨ EXISTING 8" COLUMN PIPE.
- ⑩ DOWNHOLE CONTROL VALVE.
- ⑪ LINESHAFT.
- ⑫ BOWL ASSEMBLY.



CUT TOP AND BOTTOM FLANGES TO ALLOW WEB TO MEET IN THE CORNER. WELD ALL JOINTS FLUSH.

PLAN

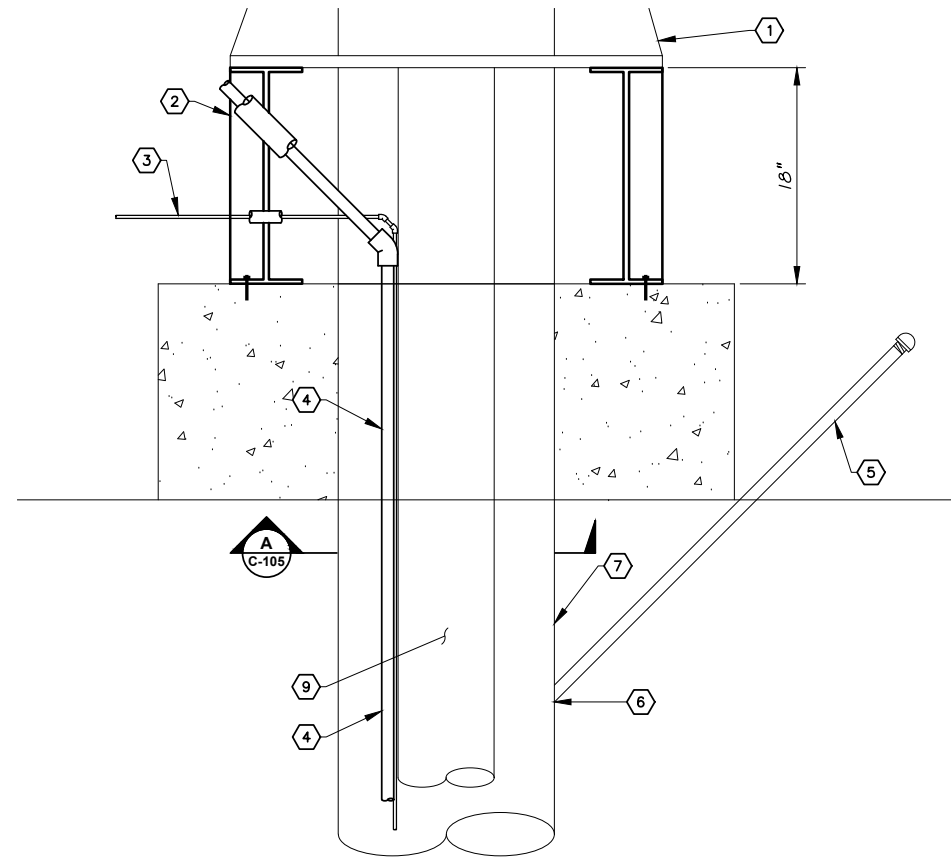
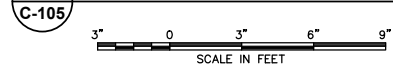


2" PIPE PENETRATION FOR TRANSDUCER CONDUIT CONNECTION

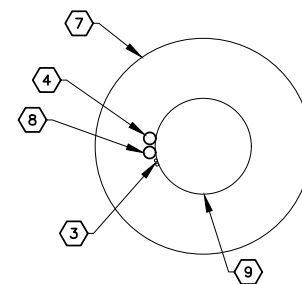
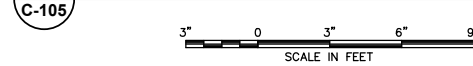
1" PIPE PENETRATION FOR HYDRAULIC HOSES

SECTION

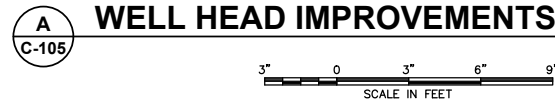
1 PUMP BASE DETAIL



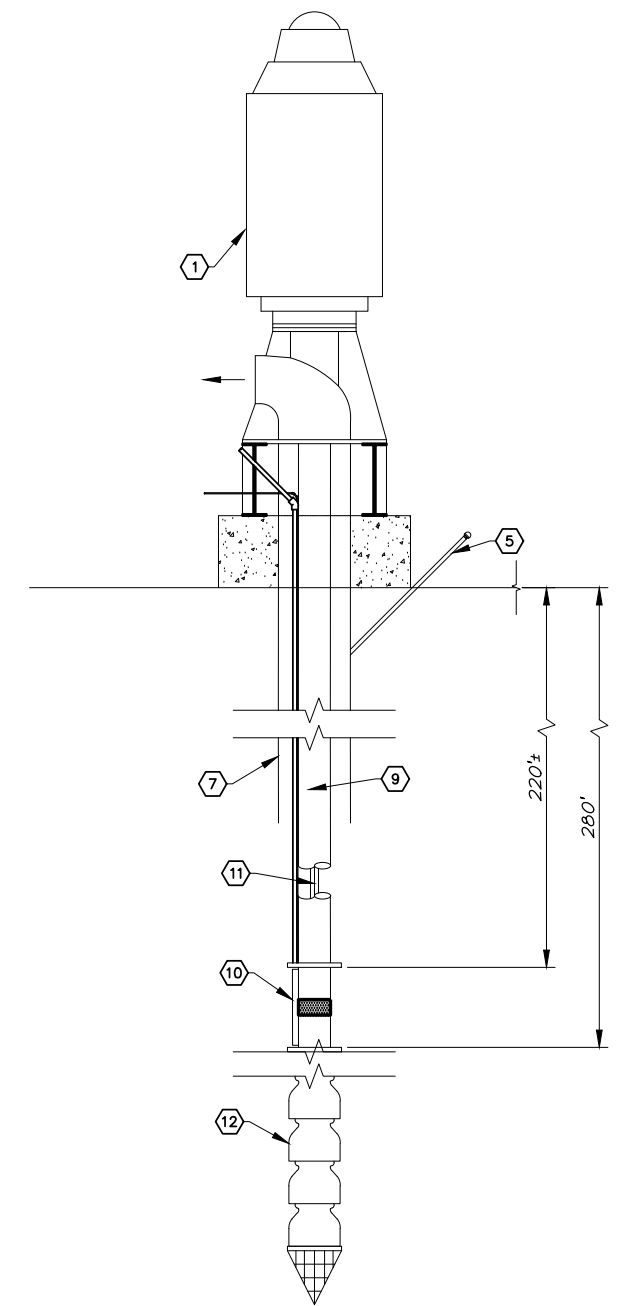
2 WELL HEAD IMPROVEMENTS



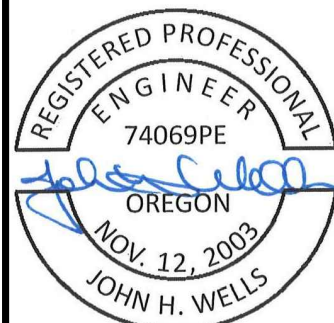
A WELL HEAD IMPROVEMENTS - SECTION A



NOTES:
1. HYDRAULIC HOSE, AIR LINE, AND PRESSURE TRANSDUCER CONDUITS SHALL BE SECURELY ATTACHED TO THE EXISTING COLUMN PIPE WITH STAINLESS STEEL BANDS AT A MAXIMUM SPACING OF 20 FEET.



3 DOWN HOLE CONTROL VALVE



RENEWS: 6-30-2020

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WELL HEAD IMPROVEMENTS II

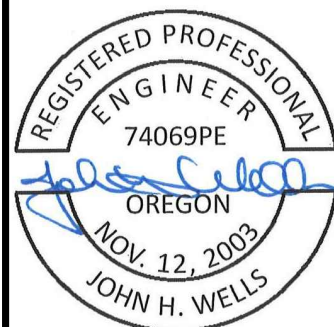
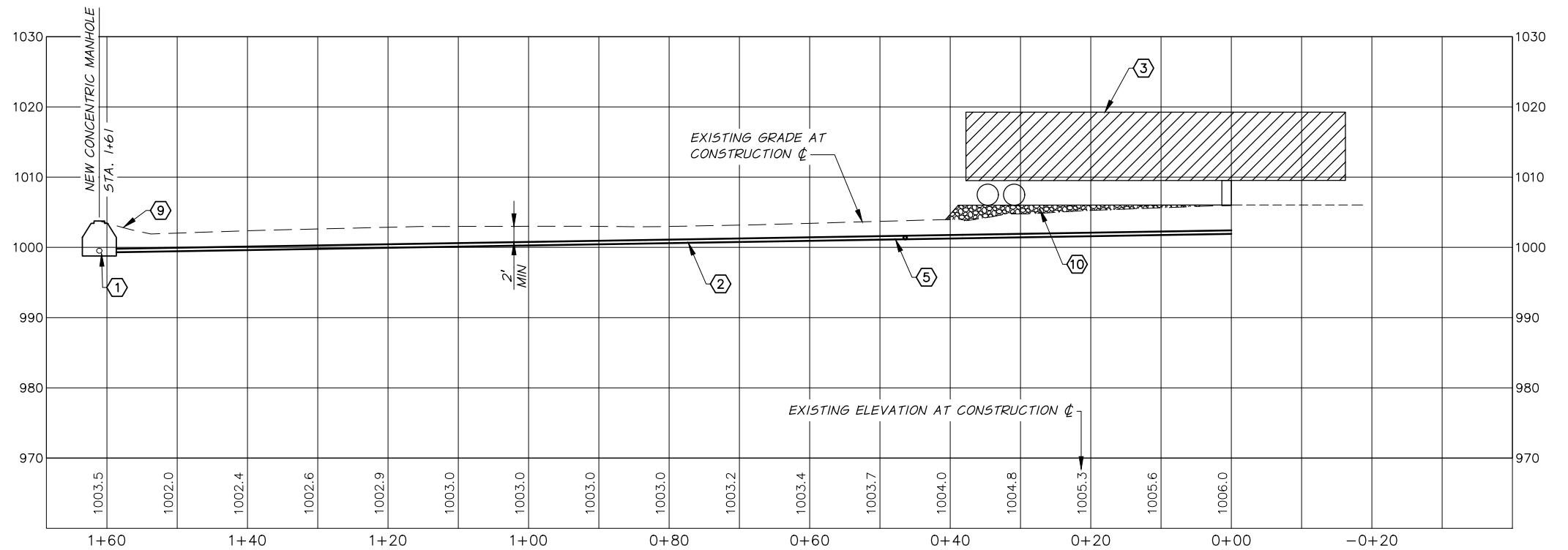
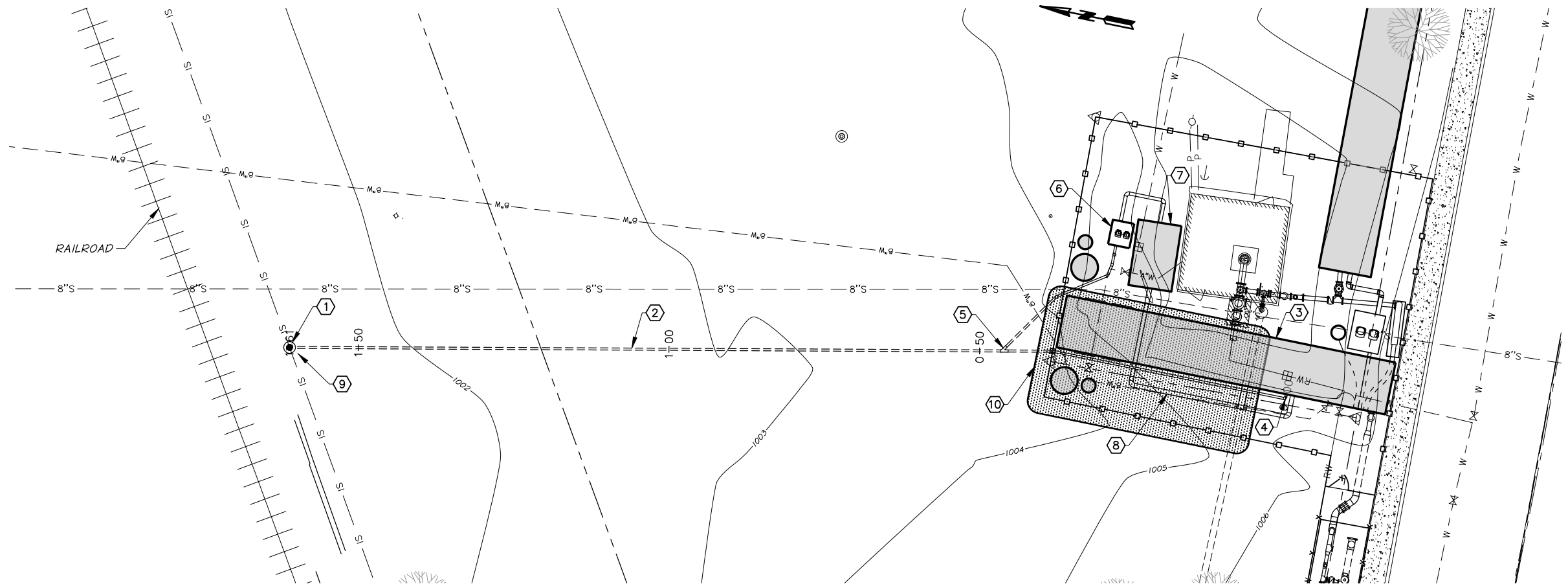
SHEET

C-105

10 OF 14

KEY NOTES

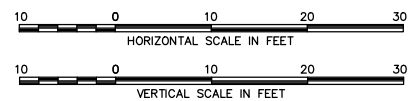
- ① CONNECT TO EXISTING 8" INDUSTRIAL SEWER LINE. EXACT LOCATION AND DEPTH UNKNOWN. VERIFY WITH CITY PRIOR TO START OF CONSTRUCTION.
- ② 6" SDR 35 WASTE LINE.
- ③ UF TREATMENT TRAILER.
- ④ WASTE OUTLET.
- ⑤ BACKWASH WASTE CONNECTION.
- ⑥ BACKWASH WASTE PUMPS.
- ⑦ BACKWASH WASTE STORAGE TANK.
- ⑧ BACKWASH WASTE LINE.
- ⑨ NEW MANHOLE, SEE SHEET C-501 FOR DETAILS.
- ⑩ IMPORT 1"-0 AGGREGATE SUB-BASE PER ODOT 00640-10 FOR SITE LEVELING COURSE. COMPACT IN 6-INCH LAYERS.



RENEWS: 6-30-2020

REVISION	BY	DATE

DESIGNED BY <i>M. BLASY</i>	JOB NUMBER 7008-625	DATE November 5, 2018
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WASTE LINE PLAN AND PROFILE

SHEET

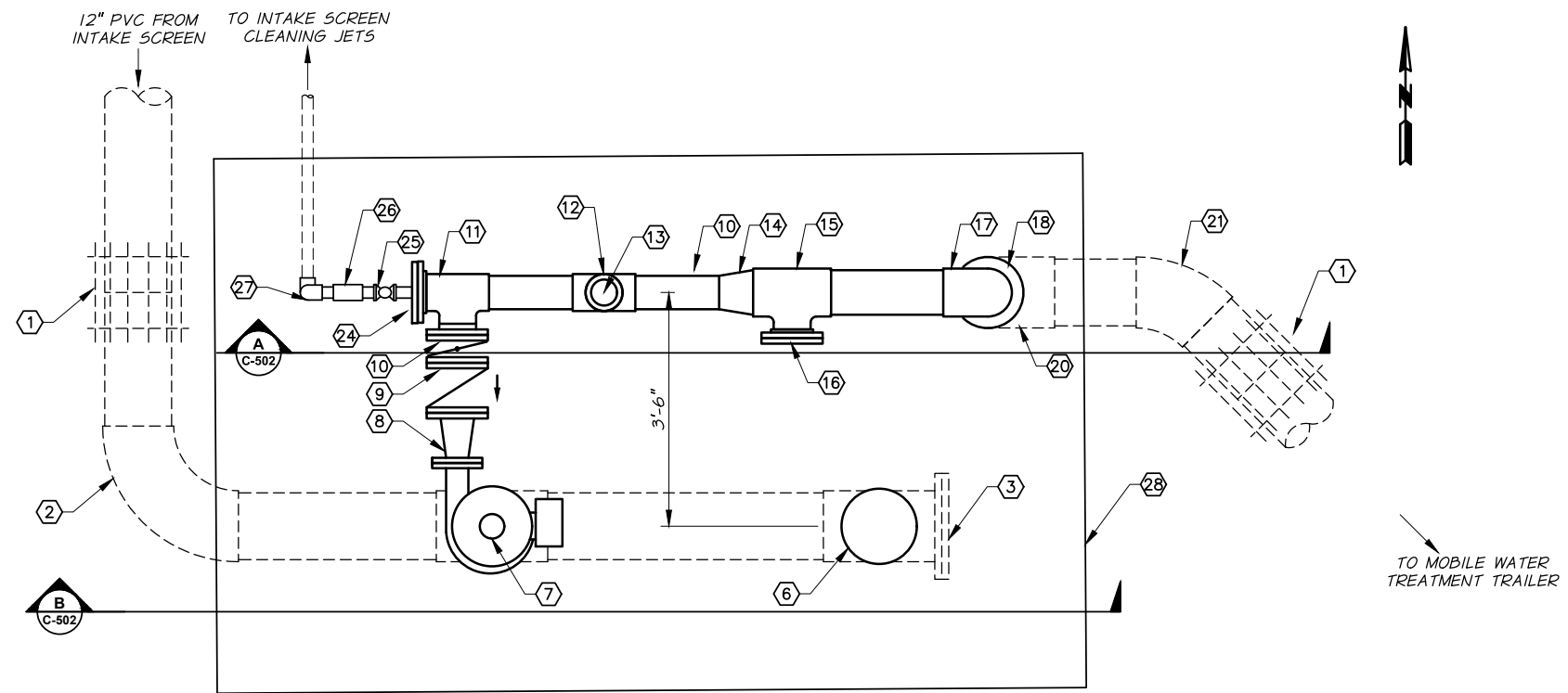
C-201

11 OF 14

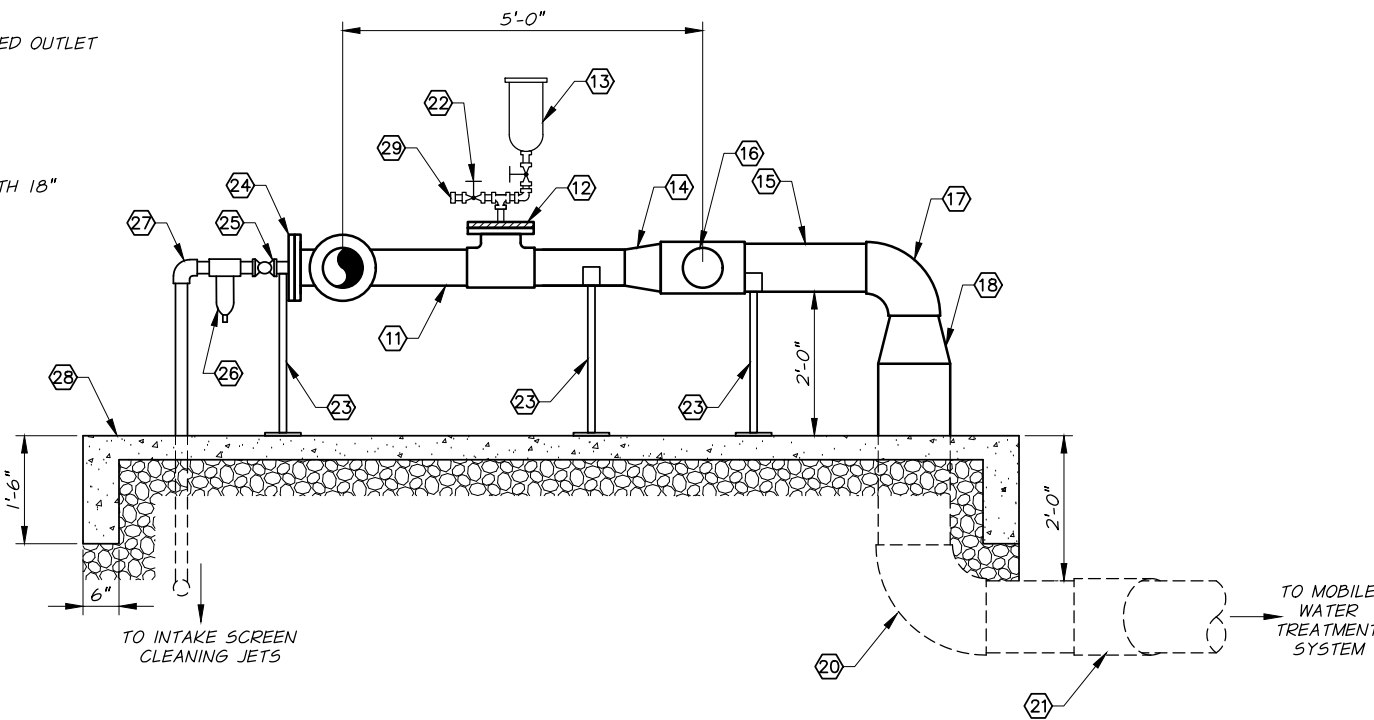
KEY NOTES

- ① 12" PVC TO 12" STEEL COUPLING
- ② 12" STANDARD WEIGHT STEEL MANIFOLD, EPOXY COATED WITH 90° BEND AND TWO 8" OUTLET TEES
- ③ 12" BLIND FLANGE
- ④ 6" RESTRAINED FLANGE COUPLING ADAPTER
- ⑤ 6" BUTTERFLY VALVE
- ⑥ 6" BLIND FLANGE
- ⑦ 40 HP VERTICAL MOUNTED CENTRIFUGAL PUMP, 6" SUCTION AND 4" DISCHARGE
- ⑧ 4"x6" REDUCER
- ⑨ 6" CHECK VALVE
- ⑩ 6" BUTTERFLY VALVE
- ⑪ 6" SCHEDULE 40 STEEL MANIFOLD, EPOXY COATED WITH TWO 6" OUTLET TEES
- ⑫ 6" TAPPED FLANGE WITH 1" THREADED OUTLET
- ⑬ 1" AIR RELEASE VALVE
- ⑭ 6"x8" REDUCER
- ⑮ STANDARD WEIGHT STEEL MANIFOLD, EPOXY COATED WITH ONE 6" OUTLET TEE, AND OTHER FITTINGS AS SHOWN
- ⑯ 6" BLIND FLANGE
- ⑰ 8" 90° BEND
- ⑱ RESERVED
- ⑲ 12" 90° BEND
- ⑳ 12" 45° BEND
- ㉑ 1" BALL VALVE
- ㉒ PIPE SUPPORT
- ㉓ 6" TAPPED FLANGE WITH 2" THREADED OUTLET
- ㉔ 2" 1/4 TURN BALL VALVE
- ㉕ 2" STRAINER
- ㉖ 2" 90° BEND
- ㉗ 13' L X 8' W X 4' D CONCRETE PAD WITH 18" FOOTING SUPPORTED ON 6" CSBC
- ㉘ 3/4" FEMALE NPT OUTLET

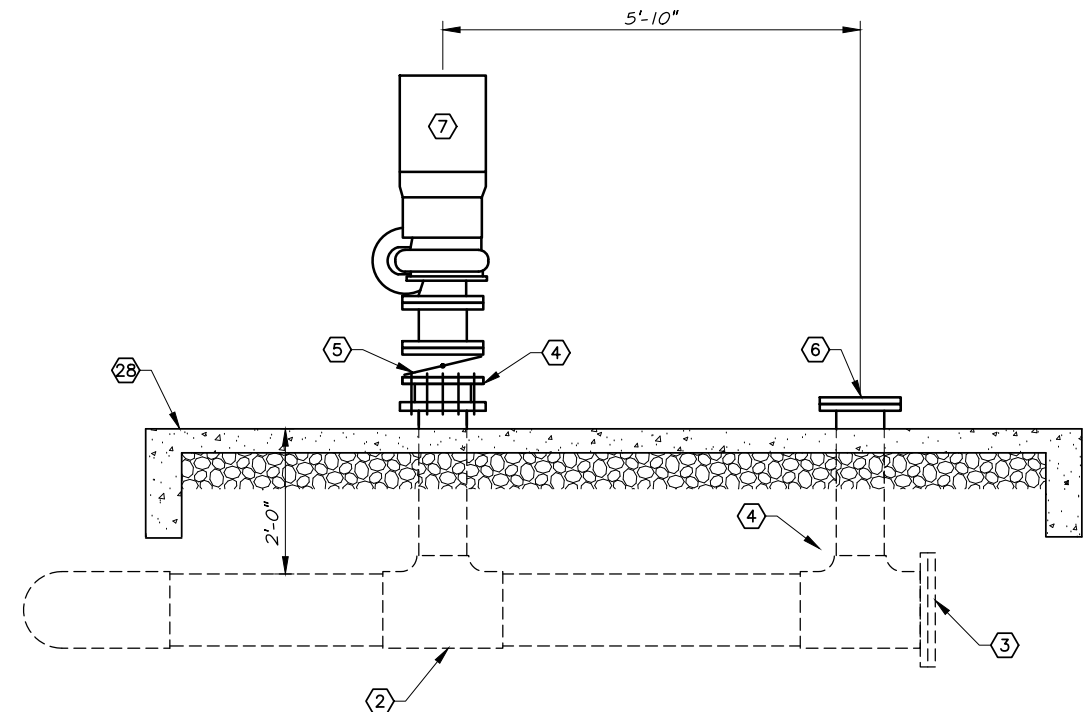
NOTES:
 1. ALL ABOVE GROUND PIPE SHALL HAVE HEAT TAPE, 3W/FT 120 VOLT SELF REGULATING HEATING CABLE WITH THERMOPLASTIC ELASTOMER JACKET.



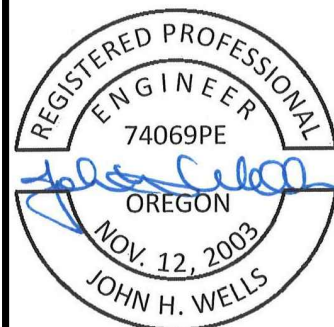
1
C-502 **INFED PUMP STATION - PLAN**



A
C-502 **DISCHARGE HEADER - SECTION A**

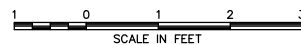


B
C-502 **SUCTION HEADER - SECTION B**



RENEWS: 6-30-2020

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INFED PUMP STATION PLAN AND SECTIONS

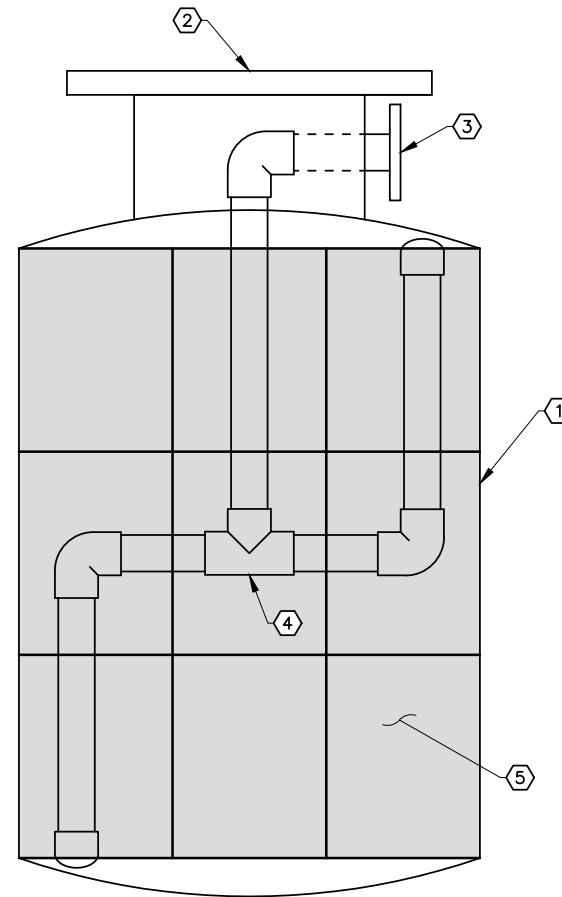
SHEET

C-202

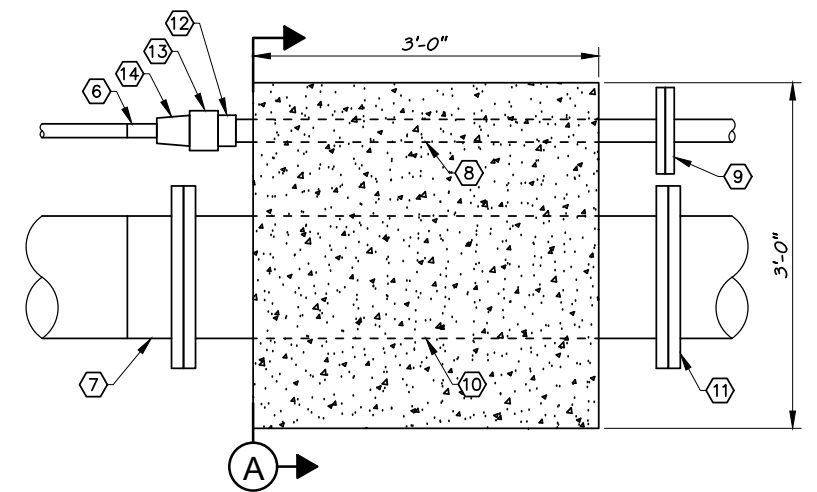
12 OF 14

KEY NOTES:

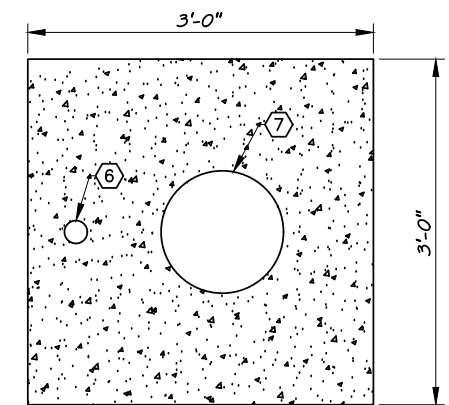
- ① INTAKE SCREEN EQUAL TO EVOQUA VAF FILTRATION SYSTEMS SELF CLEANING INTAKE SUCTION SCREEN MODEL 15-1400.
- ② 12" FLANGED OUTLET.
- ③ 1.5" SPRAY WATER SUPPLY INLET.
- ④ ROTATING SPRAY BARS WITH JET NOZZLES.
- ⑤ STAINLESS STEEL 18 MESH SCREEN.
- ⑥ 1.5" THREADED MALE X KING NIPPLE FITTING, STAINLESS STEEL
- ⑦ 12" FLANGE BY KING NIPPLE FITTING
- ⑧ 2" SCH 40 PVC EMBEDDED IN CONCRETE.
- ⑨ 2" FLANGED RPCA CONNECTION
- ⑩ 12" STEEL WITH FLG X FLG CONNECTIONS
- ⑪ 12" FLANGED RPCA CONNECTION.
- ⑫ 2" MALE CAMLOCK X THREADED FEMALE NPT, STAINLESS STEEL TYPE A
- ⑬ 2" FEMALE CAMLOCK X THREADED FEMALE NPT, STAINLESS STEEL TYPE B
- ⑭ 2" MALE X 1.5" FEMALE THREAD REDUCER BUSHING PIPE FITTING, STAINLESS STEEL, NPT



① **INTAKE SCREEN**
C-501 NTS

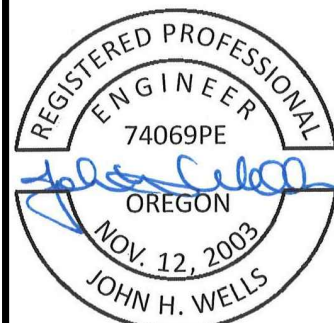


PLAN



SECTION A

② **SUCTION INTAKE CONNECTION**
C-501 NTS



RENEWS: 6-30-2020

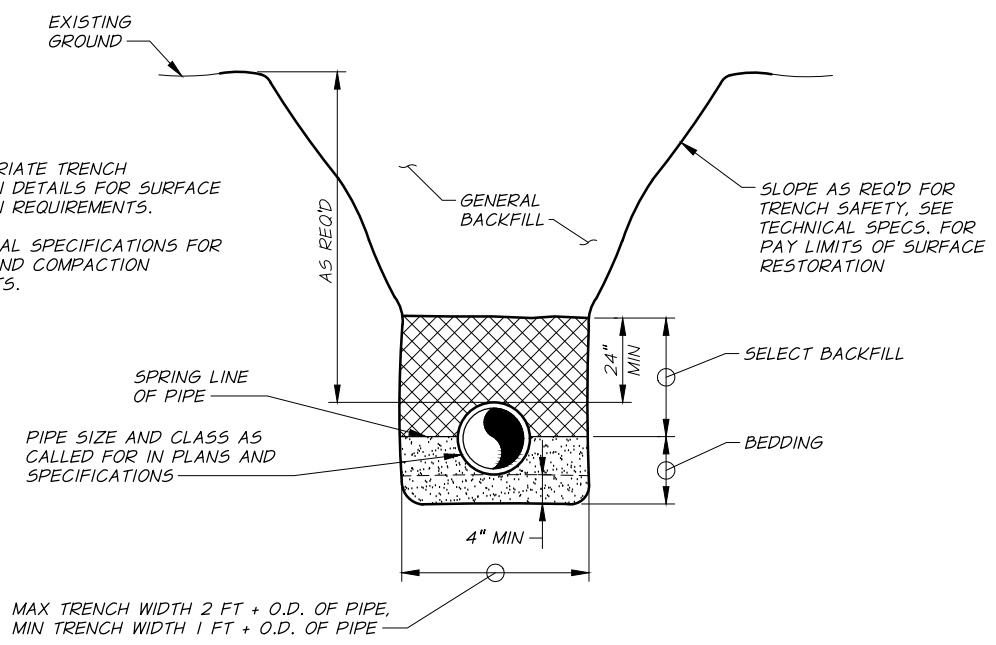
DESIGNED BY <i>M. BLASY</i>	JOB NUMBER 7008-625	DATE November 5, 2018
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AQUIFER STORAGE AND RECOVERY DEMONSTRATION PROJECT

DETAILS I

NOTES:
 1. SEE APPROPRIATE TRENCH RESTORATION DETAILS FOR SURFACE RESTORATION REQUIREMENTS.
 2. SEE TECHNICAL SPECIFICATIONS FOR MATERIALS AND COMPACTION REQUIREMENTS.

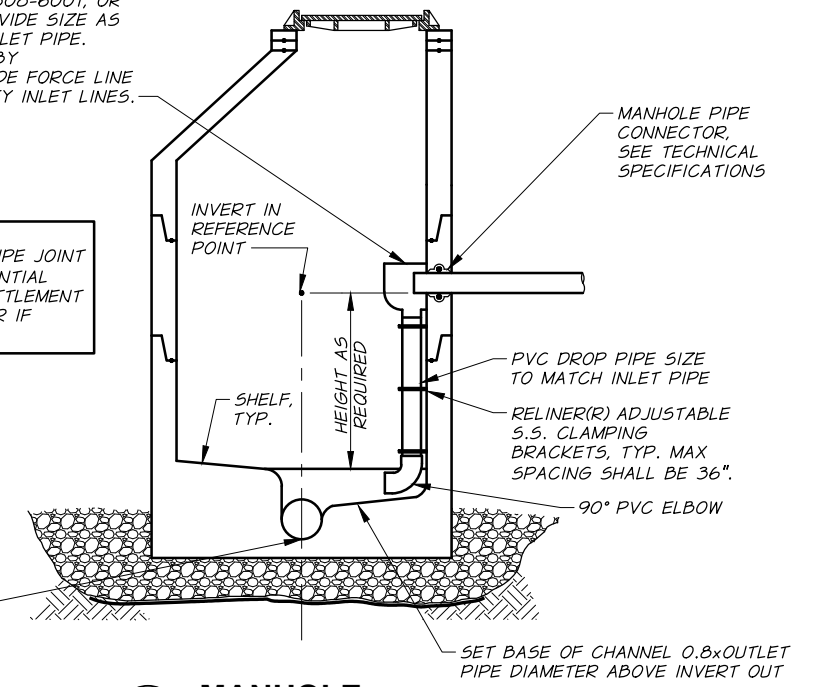


1 TRENCH DETAIL
 C-503 NTS

INSIDE DROP BOWL AS MANUFACTURED BY RELINER(R), 1-800-508-6001, OR APPROVED EQUAL. PROVIDE SIZE AS REQUIRED TO MATCH INLET PIPE. INSTALL AS REQUIRED BY MANUFACTURER. PROVIDE FORCE LINE HOOD ON HIGH VELOCITY INLET LINES.

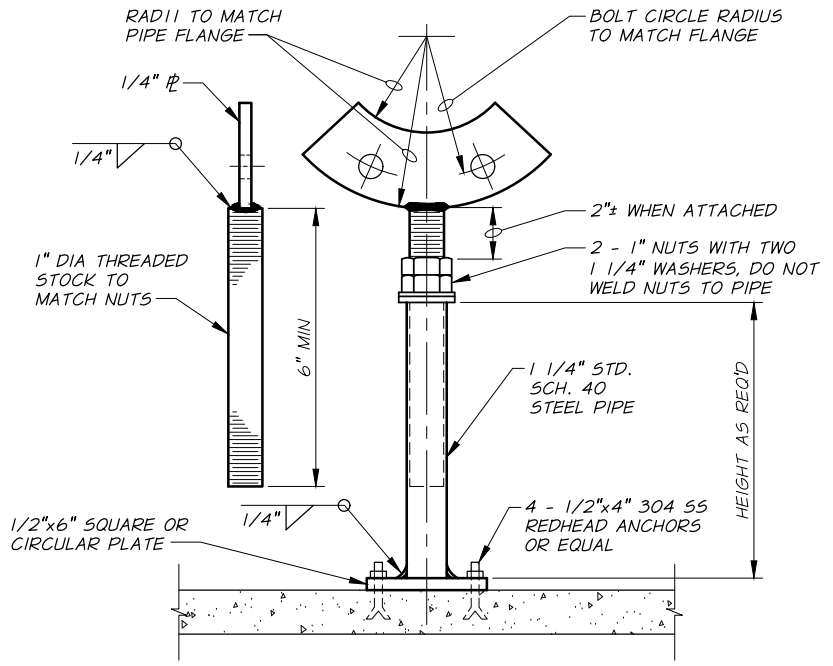
NOTE:
 SEE APPROPRIATE MANHOLE DETAIL FOR OTHER MANHOLE REQUIREMENTS.

NOTE:
 PROVIDE APPROPRIATE FLEXIBLE PIPE JOINT 1'-6" OUTSIDE OF MANHOLE IF POTENTIAL MANHOLE SETTLEMENT OR SOIL SETTLEMENT UNDER PIPE MAY BE EXCESSIVE, OR IF CONCRETE PIPE IS BEING UTILIZED.

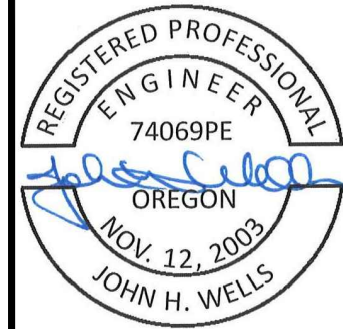


STATION AND INVERT ELEVATION REFERENCE POINTS SHOWN ON PLAN/PROFILE SHEETS. FIELD VERIFY FOR MANHOLES ON EXISTING LINES.

2 MANHOLE
 C-503 NTS



3 PIPE SUPPORT DETAIL
 C-503 NTS



RENEWS: 6-30-2020

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 AQUIFER STORAGE AND RECOVERY DEMONSTRATION PROJECT

DETAILS II

A AMPERES
 AC ALTERNATING CURRENT
 AFF ABOVE FINISHED FLOOR
 AFG ABOVE FINISHED GRADE
 AIC AVAILABLE INTERRUPT CURRENT
 ATS AUTOMATIC TRANSFER SWITCH
 BLDG BUILDING
 C CONDUIT
 CB CIRCUIT BREAKER
 CKT CIRCUIT
 CLG CEILING
 CONC CONCRETE
 CTL CONTROL
 CU COPPER
 DC DIRECT CURRENT
 DEMO DEMOLISH OR REMOVE
 DET DETAIL REFERENCE
 EA EACH
 FO FIBER OPTIC
 G GROUND
 GFI GROUND FAULT INTERRUPTER
 GND GROUND
 GRC GALVANIZED RIGID CONDUIT
 J/JB JUNCTION BOX

KA 1,000 A
 KVA 1,000 VA
 KW KILOWATT
 KWH KILOWATT HOUR

M MAGNETIC CONTRACTOR COIL
 mA MILLI AMP
 MA MOTOR ACTUATOR
 MCC MOTOR CONTROL CENTER
 MFGR MANUFACTURER
 MT MOUNT
 MTD MOUNTED
 N NEUTRAL
 NC NORMALLY CLOSED
 NEC NATIONAL ELECTRICAL CODE
 NO NORMALLY OPEN
 NTS NOT TO SCALE

OC OVER CURRENT
 OH OVER HEAD
 OL OVERLOAD
 OS OUTSIDE
 PLC PROGRAMMABLE LOGIC CONTROLLER

RECP RECEPTACLE
 RM ROOM
 RMC RIGID METAL CONDUIT
 RQD REQUIRED

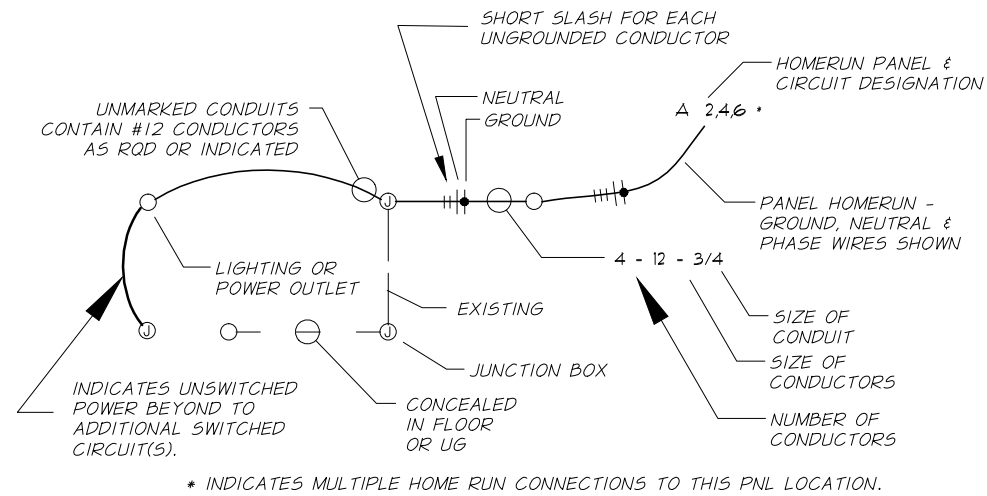
SH SHEET REFERENCE
 SHC SODIUM HYPOCHLORITE
 SPD SURGE PROTECTION DEVICE
 SS STAINLESS STEEL
 SURF SURFACE
 SW SWITCH
 TBD TO BE DETERMINED
 TSP TWISTED SHIELDED PAIR
 TYP TYPICAL

UG UNDER GROUND

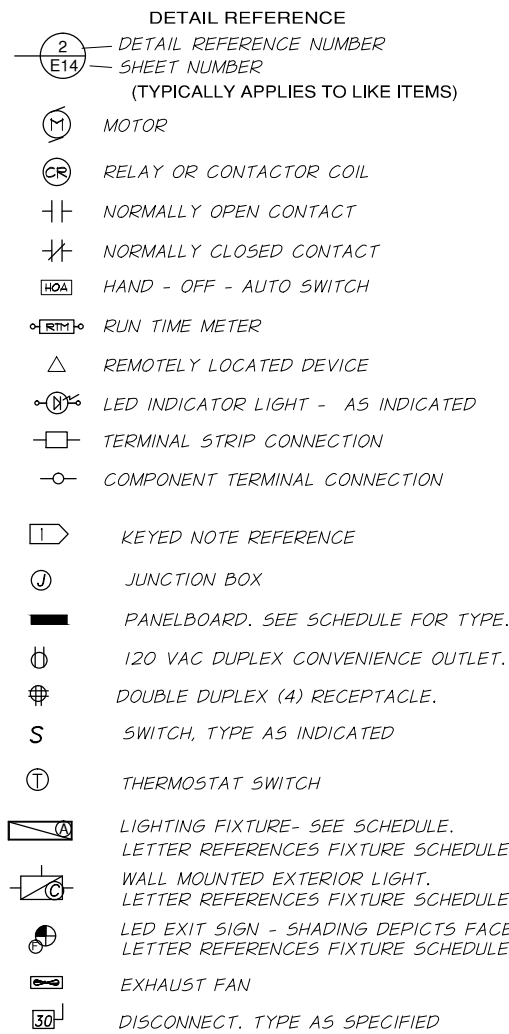
V VOLT
 VA VOLT AMPERE
 VAC SEE V & A ABOVE
 VFD VARIABLE SPEED DRIVE

W/ WITH
 WP WEATHER PROOF

ABBREVIATIONS



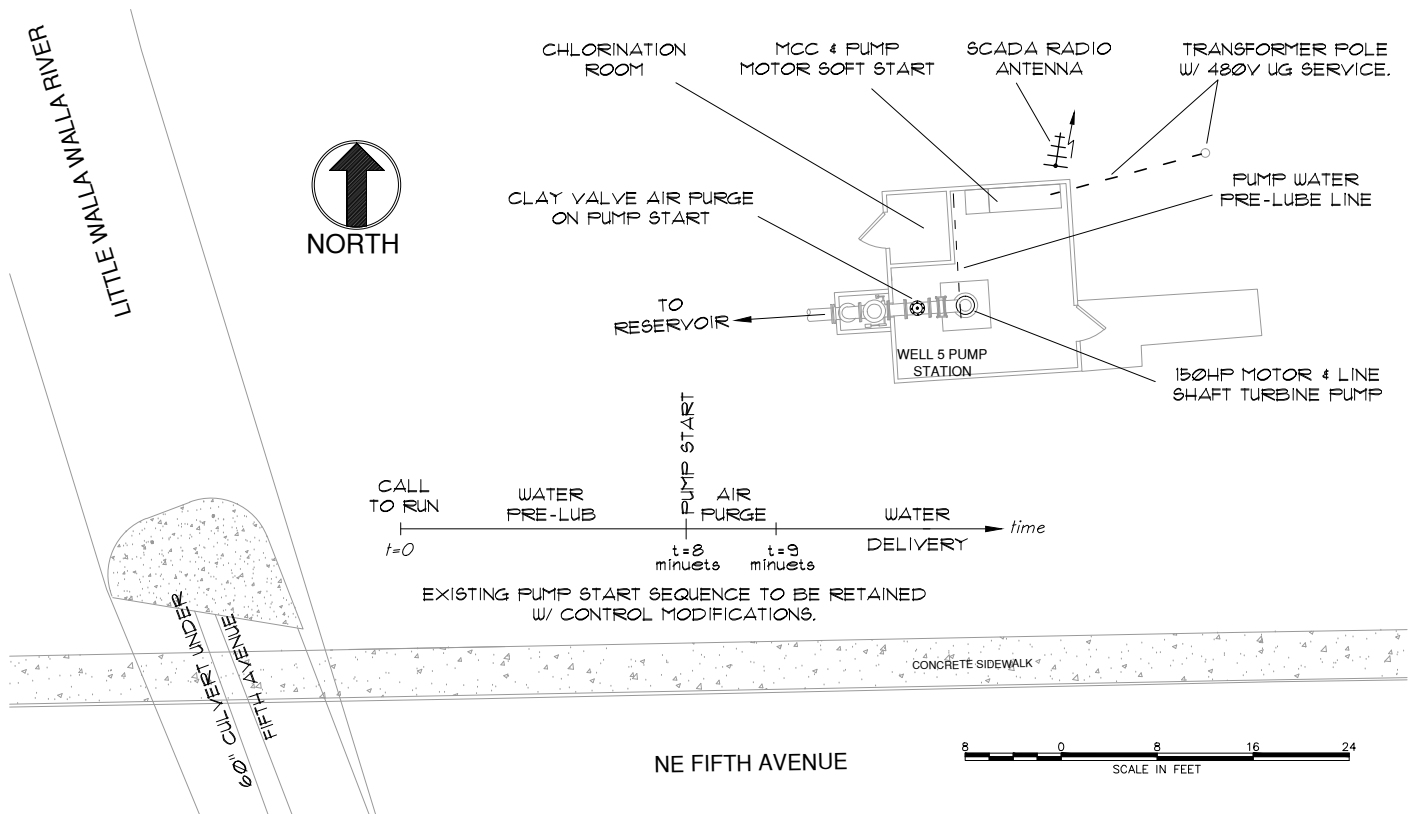
CIRCUIT SYMBOL DETAIL



ELECTRICAL LEGEND

SCOPE OF WORK

1. INSTALLATION OF DOWN HOLE 3R VALVE & WELL WATER DEPTH SENSOR LIT-1 WILL REQUIRE PUMP STATION ROOF REMOVAL. PROVIDE ELECTRICAL & INSTRUMENTATION SYSTEM DEMOLITION & RECONNECTION IN SUPPORT OF THIS WORK.
2. ELECTRICAL AS BUILT DRAWINGS WERE NOT AVAILABLE FOR EXISTING PUMP MOTOR CONTROL CKT & CLAY VALVE CV-2. THE CONTRACTOR MAY BE REQUIRED TO PROVIDE DESIGN BUILD INTERFACES FOR THESE ITEMS TO ACCOMPLISH INTENDED OPERATION.
3. PROVIDE LABOR & MATERIALS AS INDICATED ON THE DRAWINGS & SCHEDULE SITE WORK SUCH AS UNDERGROUND INSTALLATION OF ELECTRICAL & CONTROL SYSTEM RACEWAYS PRIOR TO PLACEMENT OF DEMO TRAILER & ASSOCIATED TANKS & SKIDS.
4. THE CONTRACTOR SHALL SECURE & PAY FOR PERMITS & ALL FEES NECESSARY FOR THE EXECUTION. INSPECTION & COMPLETION OF THE ELECTRICAL WORK DESCRIBED HEREIN. ALL ELECTRICAL WORK SHALL BE IN COMPLIANCE WITH THE LATEST GOVERNING ELECTRICAL CODE(S) HAVING JURISDICTION AT THE TIME THE WORK IS INSTALLED.
5. THE ELECTRICAL CONTRACTOR SHALL COORDINATE WITH THE CONTROL SYSTEM INTEGRATOR TO PROVIDE ITEMS SUCH AS BOXES, CONDUITS & WIRING INDICATED ON THE DRAWINGS & NECESSARY FOR SYSTEM OPERATION. VERIFY REQUIREMENTS OF THESE SYSTEMS & PROVIDE ELECTRICAL ITEMS AS RQD.
6. VERIFY MANUFACTURERS RECOMMENDED TYPE & SIZE OF OVERCURRENT PROTECTION DEVICE FOR ALL EQUIPMENT.
7. PROVIDE LABOR & MATERIALS FOR CONTROL & INSTRUMENTATION SYSTEM AS INDICATED ON THE DRAWINGS. PROVIDE PLC & HMI PROGRAMMING FOR SYSTEM OPERATION & MONITORING AS INDICATED HEREIN.
8. THE ELECTRICAL & CONTROL SYSTEM INSTALLATION SHALL BE COMPLETE & FULLY OPERATIONAL AT THE COMPLETION OF THE WORK. THE CONTRACTOR SHALL FURNISH A ONE (1) YEAR WRITTEN GUARANTEE ON MATERIALS & WORKMANSHIP FROM THE DATE OF ACCEPTANCE.



EXISTING ELECTRICAL SITE PLAN



EXP.: JUNE 30, 2020

DATE SEALED: 10/31/2018

REVISION	BY	DATE
DESIGNED BY J. TERRY		
DRAWN BY J. TERRY		
REVIEWED BY J. WELLS		

THIS DRAWING HAS BEEN REDUCED 50%. ADJUST SCALE ACCORDINGLY. BARSCALE SHOWN IS ACCURATE.	
JOB NUMBER 7008-625	DATE October 31, 2018
ACAD FILE:	
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 engineering surveying natural resources

WALLA WALLA BASIN WATERSHED COUNCIL
 CITY OF MILTON-FREEWATER WELL NO. 5
 AQUIFER STORAGE AND RECOVERY DEMONSTRATION PROJECT

EXISTING ELECTRICAL SITE PLAN

SHEET
E1

1/8" = 1' - 0" (AT FULL SHEET SIZE)

225 KVA TRANSFORMER BANK.
480Y/277 VAC 3-PH, 4W, 400A,
OH SERVICE BY LOCAL UTILITY.

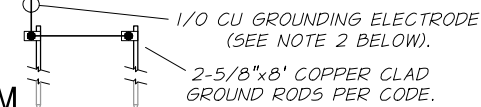
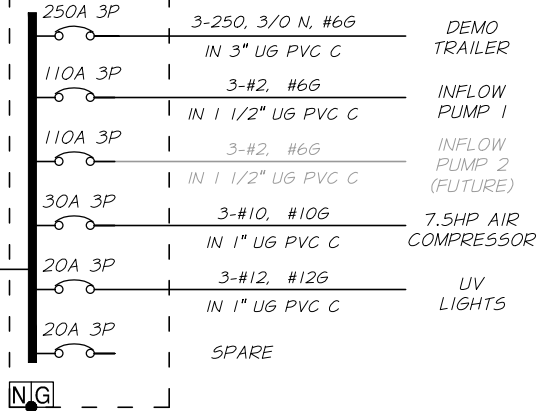


4-500 MCM
IN 3" C.



250KVA

400A ML
SERVICE PANEL



NOTES TO ONE LINE DIAGRAM

- SERVICE PANEL: TOP INCOMING, NEMA 3R, 72"x20"x6.5", 480V, 3-PH, 4W, 400 AMP, MAIN LUG, ALUMINUM BUSS, SURFACE MTD. AIC RATING AS RQD. EATON CATALOG # P3D400LT1B4H3R OR EQUAL.
- GROUNDING ELECTRODE CONDUCTOR SHALL BE ONE CONTINUOUS LENGTH WITHOUT A SPLICE OR JOINT, UNLESS SPLICED BY AN IRREVERSIBLE COMPRESSION CONNECTOR LISTED FOR THE PURPOSE OR BY EXOTHERMIC WELDING. PROVIDE TWO SERVICE & TWO GENERATOR GROUND RODS.
- UNLESS OTHERWISE NOTED, ALL WIRING SHALL BE COPPER TYPE THHN OR THWN OPERATED AT 75°C MAXIMUM. PROVIDE TERMINALS FOR FEEDERS AND BRANCH CIRCUITS WHICH ARE SUITABLE FOR THIS OPERATION.
- PROVIDE BONDING AND GROUNDING IN COMPLIANCE WITH ARTICLE 250 OF THE NATIONAL ELECTRIC CODE.
- OBTAIN THE AVAILABLE FAULT CURRENT FROM ELECTRIC UTILITY AT THE SERVICE TRANSFORMER SECONDARY & CALCULATE THE FAULT CURRENT AT THE SERVICE PANEL & SUBSEQUENT DISTRIBUTION PANELS. PROVIDE SERVICE EQUIPMENT, DISTRIBUTION PANELS & CIRCUIT BREAKERS RATED TO WITHSTAND THE AVAILABLE FAULT CURRENT AT EACH POINT IN THE POWER DISTRIBUTION SYSTEM. SUBMIT CALCULATIONS & WITHSTAND RATINGS TO ENGINEER FOR REVIEW & APPROVAL.

ONE LINE DIAGRAM

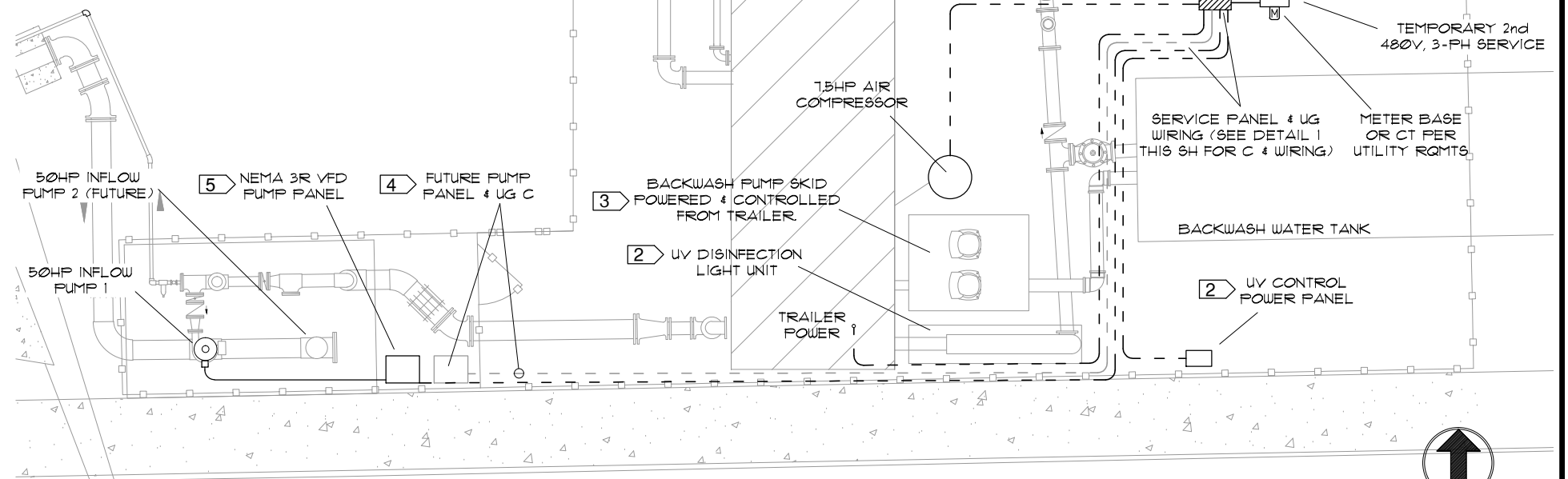
KEYED NOTES

(THIS SH)

- CONTRACTOR SHALL PROVIDE ALL COORDINATION & SCHEDULING W/ ELECTRIC UTILITY FOR INSTALLATION OF SECOND SERVICE. UTILITY CHARGES FOR INSTALLATION WILL BE PAID BY THE CITY DIRECTLY TO THE UTILITY.
- UV SYSTEM TO BE PROVIDED W/ 25' PRE-WIRED CABLE CONNECTING PANEL TO UV LIGHT UNIT & 480V TO 240V TRANSFORMER. MT PANEL AT 66" AFG ON VERTICAL STRUT UPRIGHT ASSEMBLY SET IN CONCRETE BASE.
- WIRING FOR DEMO TRAILER COMPONENTS NOT SHOWN. PROVIDE THESE CONNECTIONS AS RQD PER TRAILER MANUFACTURER INSTRUCTIONS.
- PROVIDE UG C ONLY FOR FUTURE INFLOW PUMP 2.
- NEMA 3R ENCLOSED VFD DRIVE PANEL. EGS 6-PULSE VFD W/ 5% DUAL DC LINK CHOKE, 50HP, 480V, 3-PH INPUT. CIRCUIT BREAKER DISCONNECT, 100KAIC RATED, 22mm HOA & INDICATOR LIGHTS, BX ENCLOSURE, VARNISHED BOARDS, ETHERNET/IP CONTROL INTERFACE. EATON CATALOG # EG50654A3200C0000 OR EQUAL. MT PANEL AT 66" AFG ON VERTICAL STRUT UPRIGHT ASSEMBLY SET IN CONCRETE BASE.

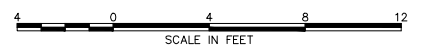
GENERAL NOTES (ALL SHEETS)

- UNDER GROUND WIRING METHOD SHALL BE SCH 40 PVC C BURIED 18" BELOW THE SURFACE PER CODE UNLESS OTHERWISE NOTED. PROVIDE TRENCHING & BACKFILL AS RQD.
- ABOVE GROUND WIRING METHOD SHALL BE SCH 40 PVC C SURFACE MTD & SUPPORTED PER CODE UNLESS OTHERWISE NOTED. PROVIDE WP METALLIC OR NONMETALLIC BOXES WHERE EXPOSED TO THE WEATHER.
- WIRING METHOD INSIDE THE PUMP STATION SHALL BE SCH 40 PVC C SURFACE MTD & SUPPORTED PER CODE UNLESS OTHERWISE NOTED. PROVIDE METALLIC OR NONMETALLIC BOXES AS RQD.
- EXCEPT AS NOTED CONDUIT RUNS WITHIN THE BUILDING SHALL BE FASTENED DIRECTLY TO WALL OR CEILING - TIGHT TO SURFACES & PARALLEL TO BUILDING LINES. LAYOUT SURFACE MTD RUNS TO AVOID CONDUITS CROSSING. PROVIDE SADDLE & BOX OFFSET BENDS AS RQD. CONDUIT SIZES INDICATED ARE MINIMUM & MAY BE INCREASED AT CONTRACTORS' OPTION BASED ON CODE OR JOB CONDITIONS.
- UNDER GROUND (UG) WIRING OR WIRING EXPOSED TO THE WEATHER SHALL BE LISTED FOR USE IN WET LOCATIONS.



NE FIFTH AVENUE

ELECTRICAL SITE PLAN



1/4" = 1' - 0" (AT FULL SHEET SIZE)



EXP.: JUNE 30, 2020

DATE SEALED: 10/31/2018

REVISION	BY	DATE
DESIGNED BY	J. TERRY	
DRAWN BY	J. TERRY	
REVIEWED BY	J. WELLS	

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WALLA WALLA BASIN WATERSHED COUNCIL
CITY OF MILTON-FREEWATER WELL NO. 5
AQUIFER STORAGE AND RECOVERY DEMONSTRATION PROJECT

ELECTRICAL SITE PLAN

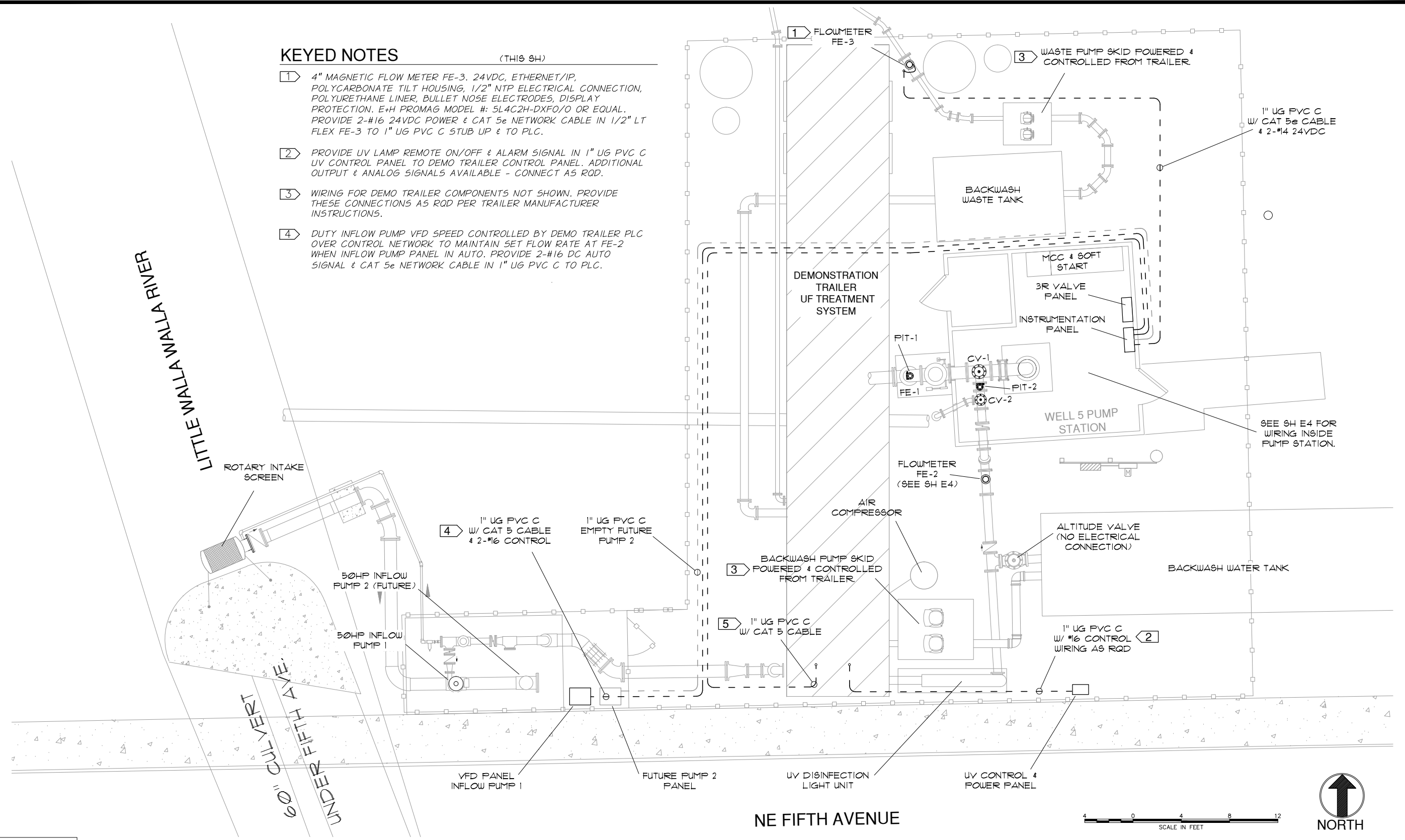
SHEET

E2

KEYED NOTES

(THIS SH)

- 1 4" MAGNETIC FLOW METER FE-3. 24VDC, ETHERNET/IP, POLYCARBONATE TILT HOUSING, 1/2" NTP ELECTRICAL CONNECTION, POLYURETHANE LINER, BULLET NOSE ELECTRODES, DISPLAY PROTECTION. E+H PROMAG MODEL #: 5L4C2H-DXFO/O OR EQUAL. PROVIDE 2-#16 24VDC POWER & CAT 5e NETWORK CABLE IN 1/2" LT FLEX FE-3 TO 1" UG PVC C STUB UP & TO PLC.
- 2 PROVIDE UV LAMP REMOTE ON/OFF & ALARM SIGNAL IN 1" UG PVC C UV CONTROL PANEL TO DEMO TRAILER CONTROL PANEL. ADDITIONAL OUTPUT & ANALOG SIGNALS AVAILABLE - CONNECT AS RQD.
- 3 WIRING FOR DEMO TRAILER COMPONENTS NOT SHOWN. PROVIDE THESE CONNECTIONS AS RQD PER TRAILER MANUFACTURER INSTRUCTIONS.
- 4 DUTY INFLOW PUMP VFD SPEED CONTROLLED BY DEMO TRAILER PLC OVER CONTROL NETWORK TO MAINTAIN SET FLOW RATE AT FE-2 WHEN INFLOW PUMP IN AUTO. PROVIDE 2-#16 DC AUTO SIGNAL & CAT 5e NETWORK CABLE IN 1" UG PVC C TO PLC.



1 INSTRUMENTATION & CONTROL SITE PLAN

1/4" = 1' - 0" (AT FULL SHEET SIZE)



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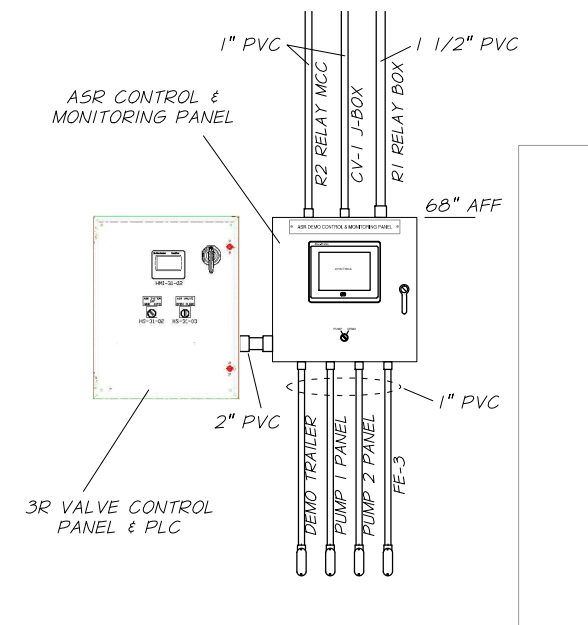
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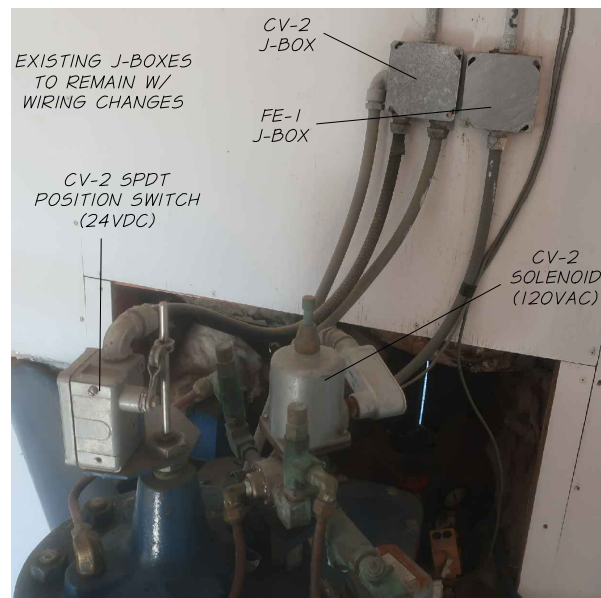
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CITY OF MILTON-FREEWATER WELL NO. 5
AQUIFER STORAGE AND RECOVERY DEMONSTRATION PROJECT

INSTRUMENTATION & CONTROL SITE PLAN

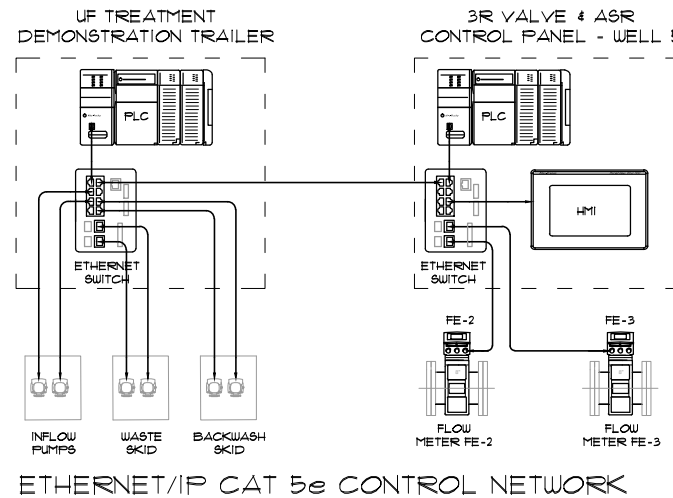
SHEET
E3



1 PANEL ELEVATION



3 EXISTING CLAY VALVE CV-2



2 NETWORK CONTROL DIAGRAM

KEYED NOTES

(THIS SH)

- 1 PROVIDE 3-#16 24V SPDT POSITION SWITCH & 2-#14 120V SOLENOID IN LT FLEX CV-1 TO J-BOX THEN 1" C TO ASR CONTROL PANEL & PLC. NEW CLAY VALVE CV-1 CONTROLLED BY PLC IN PUMP & DEMO MODES. OPEN/CLOSE VIA 120V SOLENOID (S) - POSITION (P) VIA 24V SPDT SWITCH.
- 2 EXISTING MECHANICAL FLOW METER FE-1 24V PULSE OUTPUT CONNECTS TO EXISTING MCC TELEMETRY PANEL. PROVIDE 2-#16 IN LT FLEX FE-1 TO CV-2 J-BOX THEN TO 1 1/2" OH C TO ASR CONTROL PANEL & PLC.
- 3 NEW PRESSURE TRANSDUCERS PIT-1 & 2. OUTPUT 4-20mA HART, LCD DISPLAY, PUSH BUTTON, ELECTRICAL CONNECTION VIA 1/2" NTP, SENSOR RANGE 0-150 PSI, PROCESS CONNECTION 1/2" MNTP. E+H MODEL #: PMC51-64X00/01 OR EQUAL. PROVIDE SHIELDED TWISTED PAIR 4-20mA CABLE LOOP EACH SENSOR IN LT FLEX TO R1 RELAY BOX THEN 1 1/2" OH C TO ASR CONTROL PANEL & PLC.
- 4 EXISTING CLAY VALVE CV-2 TO BE W/ SAME FUNCTIONALITY IN PUMP MODE. IN DEMO MODE PLC WILL ENERGIZE 24VDC RELAY R1 IN ENCLOSURE WHERE CONTACTS WILL BE WIRED TO PROVIDE PLC CONTROL OF CV-2 SOLENOID. PROVIDE 2-#16 24V COIL, 3-#16 SPDT POSITION SWITCH & 2-#14 120V SOLENOID IN FLEX CV-2 TO RELAY J-BOX THEN 1 1/2" C TO ASR CONTROL PANEL & PLC. SEE X ON EX FOR CONTROL DIAGRAM.
- 5 PROVIDE SUITABLE ENCLOSURE FOR RELAY R1 & AGGREGATION OF CONDUITS & WIRING FROM FE-1 & 2, PIT-1 & 2, FE-2, CV-2 & LIT-1 TO ASR PANEL & PLC VIA 1 1/2" OH C.
- 6 8" MAGNETIC FLOW METER FE-2. 24VDC, ETHERNET/IP, POLYCARBONATE TILT HOUSING, 1/2" NTP ELECTRICAL CONNECTION, POLYURETHANE LINER, BULLET NOSE ELECTRODES, DISPLAY PROTECTION. E+H PROMAG MODEL #: 5L4C2H-DXFO/O OR EQUAL. PROVIDE 2-#16 24VDC POWER & CAT 5e NETWORK CABLE VIA SHORT 1/2" LT FLEX FE-2 TO 1" PVC C THEN TO R1 RELAY BOX & 1 1/2" OH C TO ASR PANEL & PLC.
- 7 DEMO MODE PUMP INHIBIT. WIRE RELAY R2 SINGLE OR MULTIPOLE CONTACTS IN PUMP CONTROL CKT TO INHIBIT PUMP OPERATION IN ALL HOA MODES WHEN RELAY R2 COIL IS ENERGIZED BY PLC. PROVIDE 2-#16 FROM COIL TO 1" OH C TO ASR PANEL & PLC.
- 8 PROVIDE 1" C W/ 20A, 120V #12 CKTS AS RQD FROM 120/240 VAC PANEL IN MCC TO 3R VALVE CONTROL PANEL & ASR CONTROL PANEL.
- 9 SUBMERSIBLE LEVEL TRANSMITTER LIT-1. 0-175' WATER, 250' POLYURETHANE MOLDED, VENTED INTEGRAL CABLE, 0.69" DIA X 7.1" LENGTH, STAINLESS STEEL HOUSING, 2 WIRE 4-20mA, 10-35 VDC. PMC ENGINEERING VL-4-3-1-3-250 OR EQUAL. INSTALL TRANSDUCER IN WELL AT PUMP LEVEL IN 1" PROTECTIVE PVC PIPE. ROUTE CABLE FROM WELL PLATE IN 1/2" LT FLEX TO R1 RELAY J-BOX & SPLICE TO TSP THEN VIA 1 1/2" OH C TO ASR PANEL & PLC.

CONTROL NARRATIVE - PUMP MODE

PRECONDITIONS:

- A. MCC HOA IN AUTO W/ RESERVOIR CALLING FOR WATER OR HOA IN HAND POSITION.
- B. ASR CONTROL PANEL PUMP/DEMO SWITCH IN PUMP MODE (RELAY R1 & R2 DEENERGIZED)
- C. CLAY VALVE START POSITION: CV-1 OPEN (120V ON SOLENOID), CV-2 OPEN (OV ON SOLENOID)

OPERATION:

- 1. SELECTING PUMP MODE (PUMP/DEMO SWITCH) SHALL INITIATE FOLLOWING PLC ACTIONS:
 DEENERGIZE RELAYS R1 & R2 (TRANSFERS CV-2 CONTROL TO MCC, REMOVE PUMP RUN INHIBIT).
 CLOSE THE DOWN HOLE 3R VALVE.
 OPEN CV-1 (APPLY 120VAC TO CV-1 SOLENOID)
- 2. WATER PRELUBE STARTS & RUNS FOR A PRESET TIME (8 MINUTES)
- 3. AFTER PRELUBE PUMP STARTS & RUNS FOR PRESET AIR PURGE TIME (1 MINUTE)
- 4. AFTER PURGE CV-2 WILL CLOSE (120V ON SOLENOID), CV-1 REMAINS OPEN.

SEE DETAIL 1 SHEET E1 FOR STARTUP & RUN SEQUENCE UNDER MCC LEGACY CONTROL.

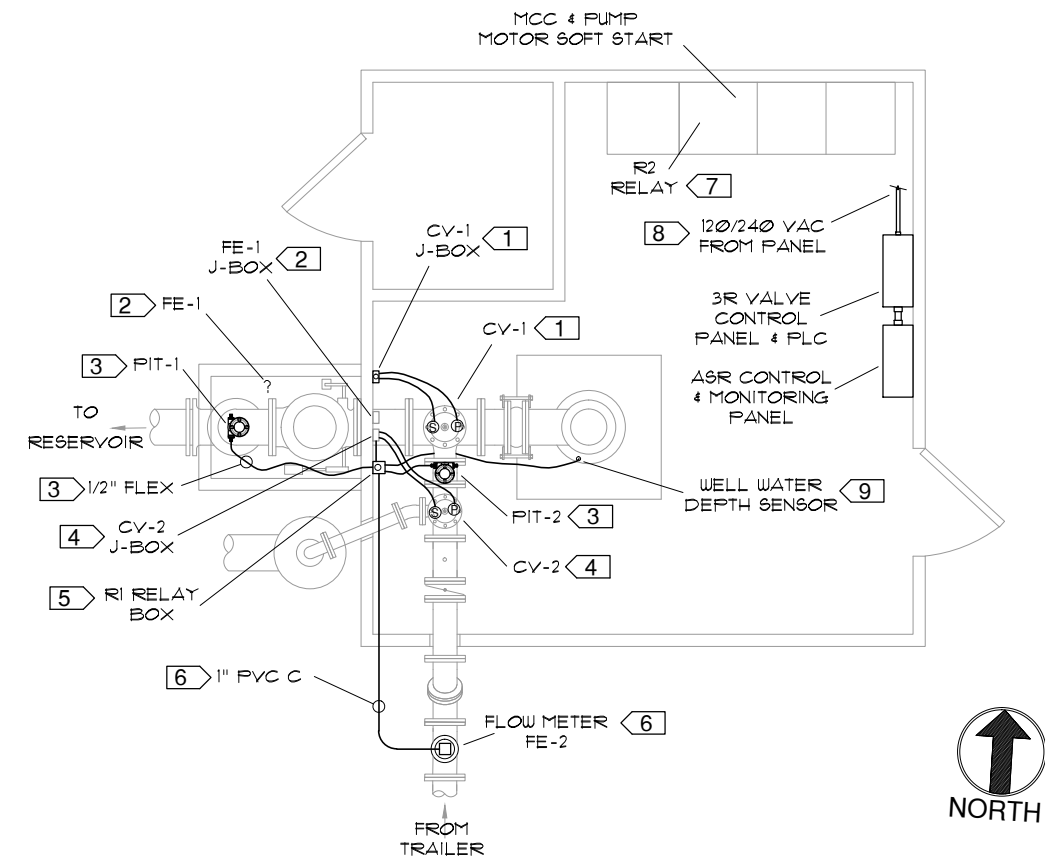
CONTROL NARRATIVE - DEMO MODE

PRECONDITIONS:

- A. ASR CONTROL PANEL PUMP/DEMO SWITCH IN DEMO MODE (RELAYS R1 & R2 ENERGIZED).
- B. CLAY VALVE START POSITION: CV-1 CLOSED (OV ON SOLENOID), CV-2 OPEN (OV ON SOLENOID)

OPERATION:

- 1. SELECTING DEMO MODE (PUMP/DEMO SWITCH) SHALL INITIATE FOLLOWING PLC ACTIONS:
 ENERGIZE RELAYS R1 & R2 (TRANSFERS CV-2 CONTROL TO PLC, INHIBITS PUMP RUN).
 OPEN THE DOWN HOLE 3R VALVE.
 SEND PERMISSIVE SIGNAL TO TO UF TRAILER PLC TO START WATER FLOW
 WATER PURGE CYCLE BEGINS & RUNS UNTIL FE-2 REGISTERS FLOW OF XXX GALLONS.
- 2. AFTER PURGE CV-1 WILL OPEN (120V ON SOLENOID), CV-2 WILL CLOSE (120V ON SOLENOID)
- 3. AT SHUTDOWN (HMI) CV-1 & CV-2 WILL RETURN TO THEIR START POSITIONS.



4 WELL 5 PUMP STATION CONTROL PLAN

3/8" = 1' - 0" (AT FULL SHEET SIZE)



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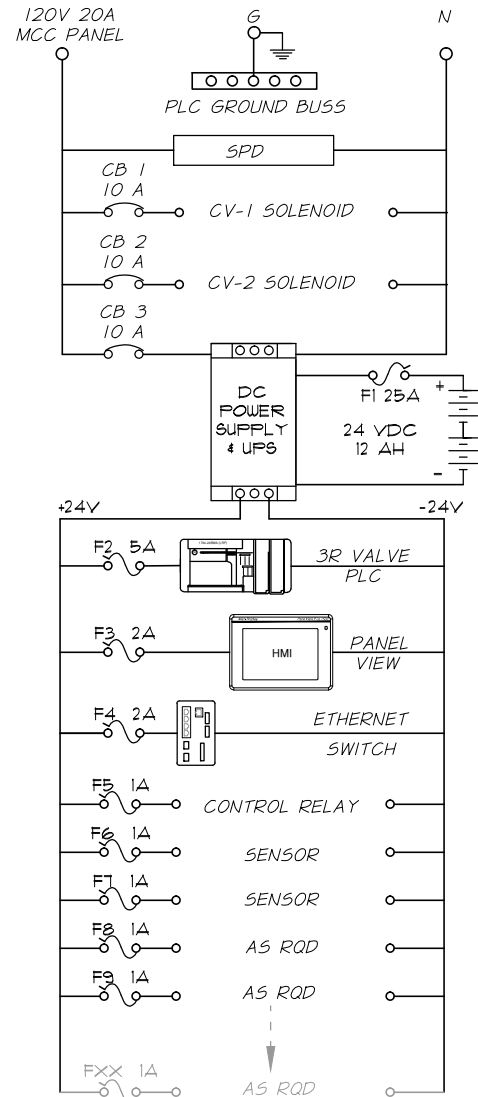
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CITY OF MILTON-FREEWATER WELL NO. 5
AQUIFER STORAGE AND RECOVERY DEMONSTRATION PROJECT

PUMP STATION CONTROL PLAN

SHEET

E4



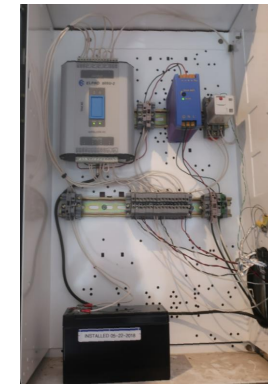
NOTES TO CONTROL POWER DIAGRAM:

1. PROVIDE 3R VALVE PLC, ASR HMI & ASSOCIATED NETWORK W/ 24VDC FROM UNINTERRUPTABLE SUPPLY.
2. 24 VDC CONNECTIONS SHALL BE FUSED EITHER BY INDIVIDUAL OR RELATED COMMON CONNECTIONS.
3. VERIFY CAPACITY OF 120/240 TRANSFORMER IN MCC TO SUPPLY ADDED LOAD.

1 AC & DC CONTROL POWER

GENERAL NOTES

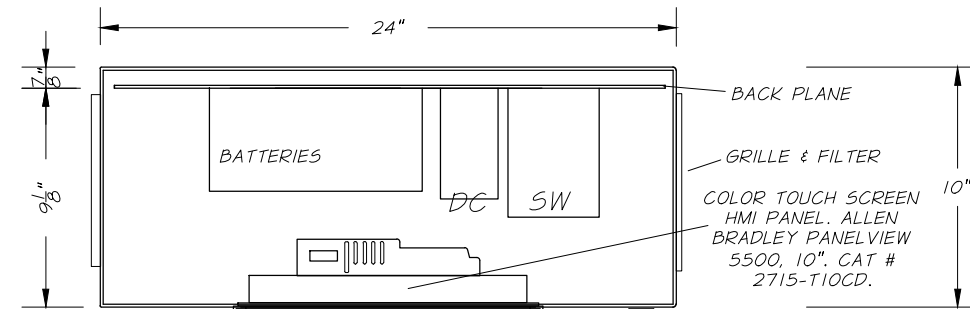
1. PROVIDE SURGE SUPPRESSION FOR INDUCTIVE LOADS SUCH AS CONTACTORS & CONTROL RELAYS PER ALLEN-BRADLEY PUBLICATION 1770-4.1 - FEBRUARY 1998. OR EQUIVANT.
2. PROVIDE FUSING FOR EACH 1769 COMPACT I/O DIGITAL OR ANALOG CONNECTION LEAVING THE PLC PANEL. FUSE PROTECTION SHALL BE IN DIN RAIL MODULES EITHER SINGLE OR MULTIPLE W/ BLOWN FUSE LED INDICATOR. FUSE RATING 250 MA MAXIMUM, FAST BLOW.
3. ANALOG 4-20 MA INPUTS & OUTPUTS SHALL BE RUN IN INDIVIDUALLY SHIELDED CONDUCTORS W/ SHIELD GROUND AT ONE POINT WITHIN THE PLC ENCLOSURE.
4. PLC CONTROL OF EACH VFD DRIVE SHALL BE VIA ETHERNET WHEN THE DRIVE HOA SWITCH IS IN THE AUTO POSITION. PLC & HMI DRIVE MONITORING SHALL FUNCTION WHEN THE HOA IS IN THE AUTO OR MANUAL POSITION. PROVIDE A "SOFTWARE" HOA FUNCTION ON THE HMI FOR OPERATOR CONTROL WHEN THE HOA IS IN THE AUTO POSITION. HAND OPERATION AT THE DRIVE SHALL BE INDEPENDENT OF THE PLC OR HMI.
5. PROVIDE FUSE ISOLATED DC VOLTAGE BY INDIVIDUAL FUNCTION SUCH AS SENSOR, VFD, ETC.
6. PROVIDE TWISTED & SHIELDED CONDUCTORS FOR ANALOG SIGNALS. DRY LOCATIONS: BELDEN 9501 #24, 8761 #22 OR 5340FI #18. OR EQUAL. WET LOCATIONS: BELDEN 83702 #16 OR EQUAL.
7. CIRCUITS DIAGRAMS ILLUSTRATE DESIGN INTENT & FUNCTION. AS SUCH THEY ARE GENERAL IN NATURE. THE CONTRACTOR IS RESPONSIBLE FOR ELECTRICAL & CONTROL SYSTEM DESIGN IN ACCORDANCE WITH THE INFORMATION PROVIDED IN THE DRAWINGS & TECHNICAL SPECIFICATIONS. SUBMITTAL OF COMPLETE & DETAILED DESIGN DOCUMENTATION IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS IS REQUIRED.



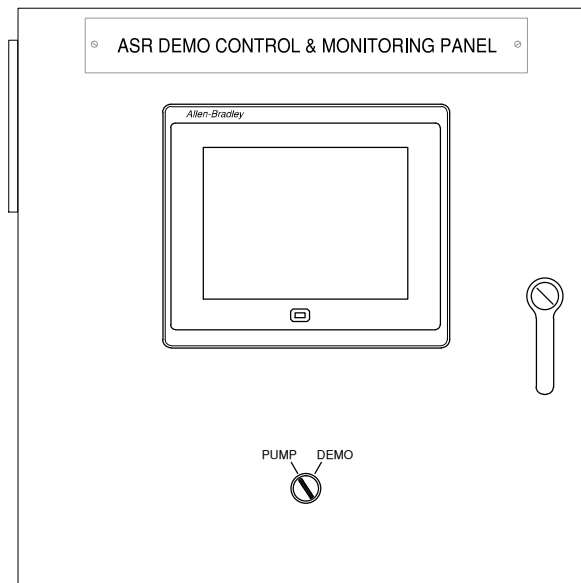
POWER OUTAGE:

1. ALARM SIGNAL ON FAULT OR POWER OUTAGE SHALL BE PROVIDED BY PLC TO EXISTING BATTERY BACKED CITY SCADA TELEMETRY RADIO LOCATED IN MCC (SEE LEFT).
2. ASR PLC & HMI SHALL BE POWERED FROM 24V DC SUPPLY W/ BATTERY BACKUP AS INDICATED.
3. POWER OUTAGE WHILE OPERATING IN DEMO MODE SHALL REQUIRE OPERATOR INTERVENTION & MANUAL RESET TO RESTART.

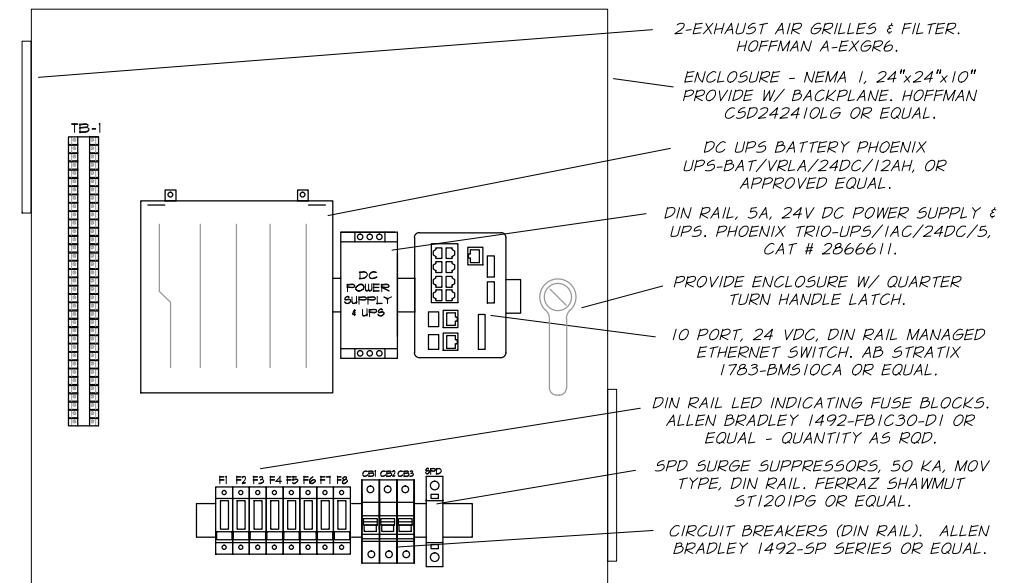
2 EXISTING TELEMETRY



ENCLOSURE DEPTH LAYOUT



OPERATOR VIEW



COMPONENT VIEW

3 ASR CONTROL & MONITORING PANEL

NTS

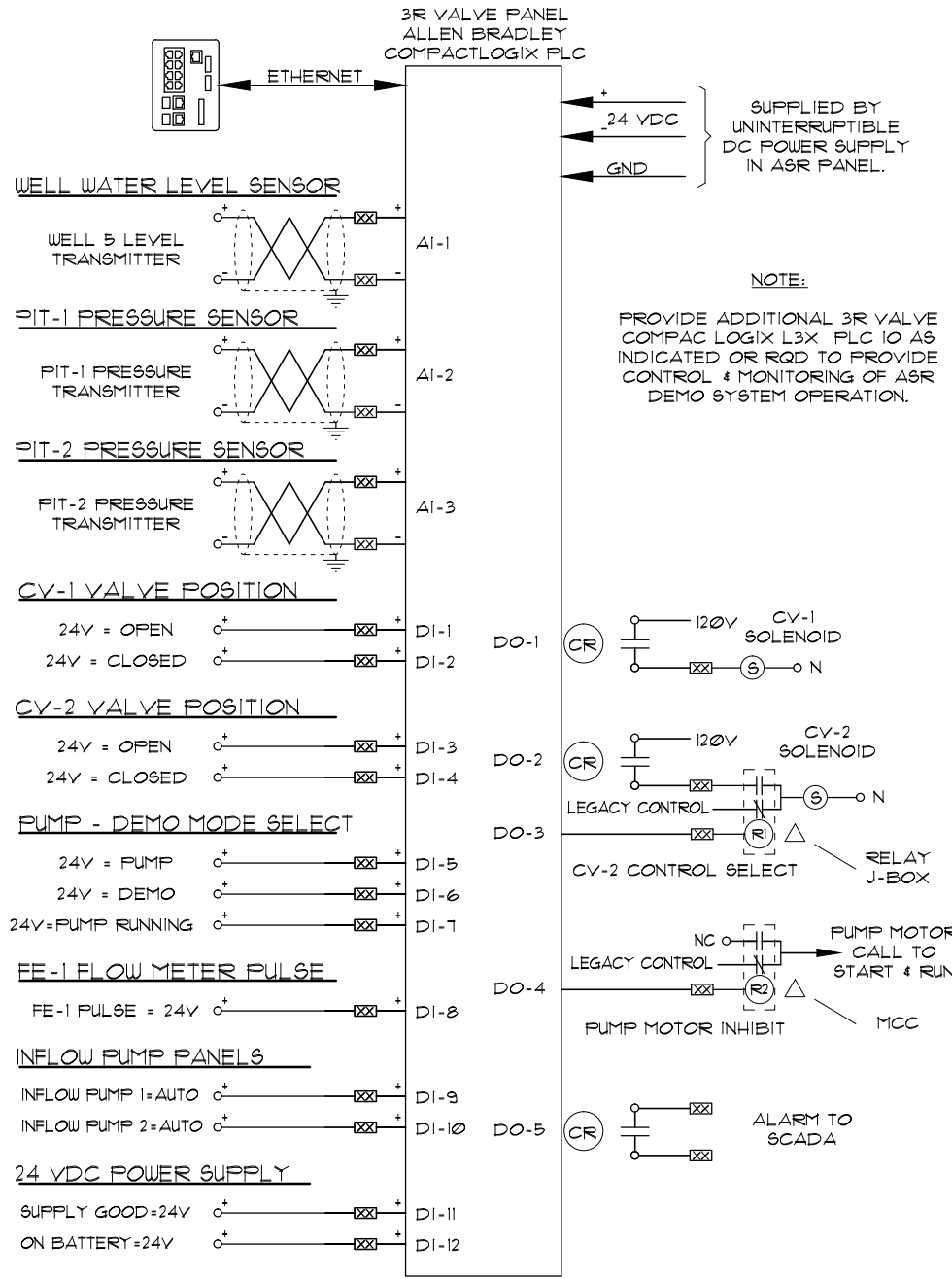


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 CITY OF MILTON-FREEWATER WELL NO. 5
 AQUIFER STORAGE AND RECOVERY DEMONSTRATION PROJECT
 ASR CONTROL & MONITORING PANEL



SOME INTERFACES MAY BE OTHER THAN 24V DC. PROVIDE ALTERNATE PLC IO OR VOLTAGE TRANSLATION AS REQD.

PROGRAMMING - GENERAL

1. THE HUMAN MACHINE INTERFACE (HMI) SCREENS SHALL BE DESIGNED & PROGRAMMED TO PROVIDE A GRAPHICAL REPRESENTATION OF THE SYSTEM COMPONENTS, THEIR INTERCONNECTIONS & STATUS PROVIDING THE OPERATOR WITH AN OVERVIEW OF THE WATER SYSTEM OPERATIONAL STATE. THE INTEGRATOR SHALL BE RESPONSIBLE FOR THE DESIGN & LAYOUT OF HMI SCREENS IN A MANNER MEETING THE INTENT OF THE SCREEN DESIGN & FUNCTIONALITY INCLUDING THE FOLLOWING:

- > PROVIDE REAL TIME OPERATOR STATUS OF STATION OPERATION
- > APPROPRIATE USE OF ANIMATED GRAPHICS TO INDICATE CURRENT STATUS
- > PROVIDE INTUITIVE MULTI-SCREEN NAVIGATION TO & FROM INFORMATION SCREENS
- > COLLECT & DISPLAY DATA SUCH AS FLOW TOTALS REQUIRED BY THE OPERATOR
- > PROVIDE MEANS FOR OPERATOR MANUAL COMPONENT OPERATION
- > PROVIDE ALARM NOTIFICATION & ACKNOWLEDGMENT
- > PROVIDE TREND SCREENS OF OPERATIONAL HISTORY

2. HMI SCREENS SHALL BEGIN WITH THE HOME OR TOP LEVEL SCREENS FOR PUMP & DEMO MODES OF OPERATION. COLORS SHALL BE USED IN A CONSISTENT MANNER TO INDICATE STATUS & OPERATION OF THE VARIOUS COMPONENTS OF THE SYSTEM SUCH AS PUMPS RUNNING, OFF OR OUT OF SERVICE. DEFINE THESE COLORS & THEIR CORRESPONDING SIGNIFICANCE ON A LEGEND SCREEN & USE THEM IN A CONSISTENT MANNER ON ALL SCREENS THROUGHOUT THE PROJECT. ANIMATIONS SHALL BE USED WHERE APPROPRIATE TO INDICATE CURRENT STATUS OF ITEMS SUCH AS WATER LEVEL, FLOW AND PRESSURE. PRESENCE OR ABSENCE OF NEW ALARMS OR EVENTS SHALL ALSO BE INDICATED ON THIS SCREEN.

3. TOUCH SCREEN NAVIGATION CAPABILITY OF THE DISPLAY SHALL BE USED TO PROVIDE MORE DETAILED INFORMATION FOR EACH ITEM USING SECOND & THIRD LEVEL SUB SCREENS AS REQUIRED WHICH THE OPERATOR CALLS BY TOUCHING THE ITEM OF INTEREST. WHERE SUB SCREENS MAY NOT PERTAIN TO A PARTICULAR ITEM SUCH AS A SCREEN LISTING ALARMS OR DAILY FLOW TOTALS PROVIDE A MENU STRUCTURE TO THESE ITEMS AND BACK TO THE HOME SCREEN.

4. THE DESIGN INTENT FOR THE HOME SCREEN IS TO PROVIDE THE OPERATOR AN OVERVIEW OF THE SYSTEM IN GRAPHICAL FORM. SUITABLE COLORS, GRAPHICS & ANIMATION SHALL BE PROVIDED ON THE HOME SCREEN IN ORDER TO CONVEY THE STATE OF THE WATER SYSTEM TO THE OPERATOR AT A GLANCE. PROVIDE COLOR SCREEN & COMPONENT MOCKUPS OF PROPOSED HMI LAYOUT TO THE ENGINEER FOR APPROVAL EARLY IN THE PROGRAMMING PROCESS.

5. THE SYSTEM SHALL REVERT TO THE HOME SCREEN DISPLAY AFTER AN APPROPRIATE PERIOD OF OPERATOR INACTIVITY & POWER DOWN TO A SCREEN SAVER DURING LONG PERIODS OF INACTIVITY.

PROGRAMMING - PUMP MODE

1. PUMP MODE HOME SCREEN SHALL REPRESENT RELEVANT SYSTEM COMPONENTS IN GRAPHIC FORM CLOSELY RELATED TO THEIR PHYSICAL APPEARANCE. PROVIDE PLC & HMI PROGRAMMING FOR THE USE OF ANIMATION, COLOR & REAL TIME PERFORMANCE DATA REPRESENTING THEIR CURRENT STATE. THESE SHALL INCLUDE THE PUMP, WELL WATER LEVEL (LIT-1), FLOWMETER FE-1, CLAY VALVES CV-1 & CV-2, PRESSURE TRANSMITTERS PIT-1 & PIT-2 AS WELL AS POSITION OF THE 3R VALVE.

2. PROVIDE PLC & HMI PROGRAMMING TO INDICATE ON THE MAIN SCREEN OR SUBSCREEN TOTAL FLOW TO THE RESERVOIR. PROVIDE A SET OF TREND SCREENS FOR THE PAST 48 HOURS THAT INCLUDE WELL RUN EVENTS, PIT-1 PRESSURE PROFILE, WELL WATER LEVEL & FLOW TOTALS FOR THE PAST DAY, SEVEN DAYS & MONTH.

3. PROVIDE PROGRAMMING AS REQD TO INDICATE THE CURRENT STATE OF THE PUMP ON THE MAIN SCREEN SUCH AS OFF, WATER PRELUDE IN PROCESS, PURGE IN PROCESS OR RUNNING. INDICATE THE CURRENT POSITION OF CLAY VALVES CV-1 & CV-2. PROVIDE A SUBSCREEN FOR EACH VALVE SO THAT THEY CAN BE MANUALLY OPENED OR CLOSED FROM THE HMI.

PROGRAMMING - DEMO MODE

1. DEMO MODE HOME SCREEN LIKE THE PUMP HOME SCREEN WILL REPRESENT RELEVANT SYSTEM COMPONENTS CLOSELY RESEMBLING THEIR PHYSICAL APPEARANCE. THE HOME SCREEN SHALL BE A PICTURE OF THE PROCESS ANIMATED TO INDICATE THE REAL TIME STATE. PROVIDE PLC & HMI PROGRAMMING FOR THE USE OF ANIMATION, COLOR & REAL TIME PERFORMANCE DATA. THESE SHALL INCLUDE THE WELL WATER LEVEL (LIT-1), FLOWMETERS FE-1, FE-2 & FE-3, CLAY VALVES CV-1 & CV-2, PRESSURE TRANSMITTERS PIT-1 & PIT-2 & POSITION OF THE 3R VALVE.

2. IN ADDITION TO (1) ABOVE THE DEMO HOME SCREEN SHALL DEPICT THE REMAINING SYSTEM COMPONENTS ASSOCIATED WITH THE DEMO TRAILER & THEIR STATUS. THESE INCLUDE BACKWASH PUMPS, WASTE PUMPS, INFLOW PUMPS & UV DISINFECTION STATUS.

3. PROVIDE PLC & HMI PROGRAMMING TO INDICATE ON THE MAIN SCREEN OR SUBSCREEN TOTAL ASR FLOW INTO THE WELL FOR THE PAST DAY, SEVEN DAYS & MONTH. PROVIDE A SET OF TREND SCREENS FOR THE PAST 48 HOURS THAT INCLUDE BACKWASH, PUMP TO WASTE & OTHER RELEVANT EVENTS. PROVIDE 48 HOUR TREND DISPLAY FOR FE-2 & FE-3 FLOW RATE. PROVIDE REAL TIME PIT-1 PRESSURE PROFILE, WELL WATER LEVEL & FLOW TOTALS FOR THE PAST DAY, SEVEN DAYS & MONTH.

4. PROVIDE PROGRAMMING AS REQD TO INDICATE THE CURRENT POSITION OF CLAY VALVES CV-1 & CV-2. PROVIDE A SUBSCREEN FOR EACH VALVE SO THAT THEY CAN BE MANUALLY OPENED OR CLOSED FROM THE HMI.

5. PROVIDE PROGRAMMING TO ACKNOWLEDGE PRESENCE OF ALTITUDE VALVE CONTROLLING FILL OF THE BACKWASH WATER TANK. WHEN THIS TANK REQUIRES WATER THERE WILL BE DIMINISHED FLOW AT FE-2 UNTIL THE TANK HAS FILLED. REDUCED FLOW AT FE-2 SHOULD RESULT IN THE DUTY INFLOW PUMP OPERATING AT LINE (IE FULL) SPEED. THIS EVENT SHALL BE DETECTED OVER THE CONTROL NETWORK TO DISPLAY & INDICATE THE BACKWASH TANK IS FILLING.

6. PROVIDE PLC & HMI PROGRAMMING TO INDICATE STATUS OF PUMPS IN THE SYSTEM SUCH AS THE DUTY BACKWASH PUMP, WASTE PUMP & INFLOW PUMP. THIS INFORMATION SHALL BE OBTAINED OVER THE CONTROL NETWORK FROM THE DEMO TRAILER PLC.

PROGRAMMING - ALARMS

1. OPERATOR ALARMS RECOGNIZED BY THE PLC SHALL BE LOGGED BY THE HMI OR PLC AS THEY OCCUR. EACH ALARM SHALL CARRY A SHORT ASSOCIATED EMBEDDED WORD DESCRIPTION, INCLUDE A TIME STAMP AND BE LISTED IN CHRONOLOGICAL ORDER STARTING WITH THE MOST RECENT.

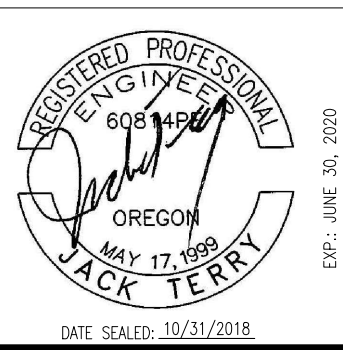
2. ALARMS SHALL INDICATE AN IMMEDIATE OR URGENT SITUATION REQUIRING OPERATOR INTERVENTION. PRESENCE OF AN ACTIVE ALARM SHALL BE INDICATED ON THE HMI HOME SCREENS USING A FLASHING MESSAGE TO ATTRACT ATTENTION. ON APPROPRIATE SUB SCREENS PROVIDE A LISTING OF THE MOST RECENT 50 ALARMS CHRONOLOGICALLY. PROVIDE MEANS FOR ACKNOWLEDGING ALARMS INCLUDING A TIME STAMP FOR SUCH ACTIONS. INDICATE STATUS OF PAST ALARMS SUCH AS ACTIVE, ACKNOWLEDGED OR CLEARED. ONCE AN ALARM IS ACKNOWLEDGED IT SHALL REMAIN ON THE LIST UNTIL REPLACED. THE OPERATOR SHALL BE ABLE TO MANAGE, VIEW & ACKNOWLEDGE ALARMS ON THE HMI WHILE PRESENT AT THE PUMP STATION.

3. ALARMS SHALL INCLUDE BUT NOT NECESSARILY BE LIMITED THOSE IDENTIFIED HEREIN & SUMMARIZED BELOW:

1. WASTE PUMP CALLED TO RUN WITH NO OR LOW FLOW
2. BACKWASH PUMP CALLED TO RUN WITH NO OR LOW FLOW
3. HIGH OR LOW WELL WATER LEVEL (2-ALARMS)
4. UTILITY POWER OUTAGE
5. 3R VALVE POSITION INDICATION MISSING OR ERROR
6. UV SYSTEM FAIL
7. DC UPS FAIL
8. CLAY VALVE CV-1 NOT RESPONDING
9. CLAY VALVE CV-2 NOT RESPONDING

EACH ALARM SHALL BE OPERATOR SELECTABLE ON OR OFF.

1 PLC CONNECTION DIAGRAM



REVISION	BY	DATE
DESIGNED BY J. TERRY		
DRAWN BY J. TERRY		
REVIEWED BY J. WELLS		

JOB NUMBER 7008-625 DATE October 31, 2018
 ACAD FILE:
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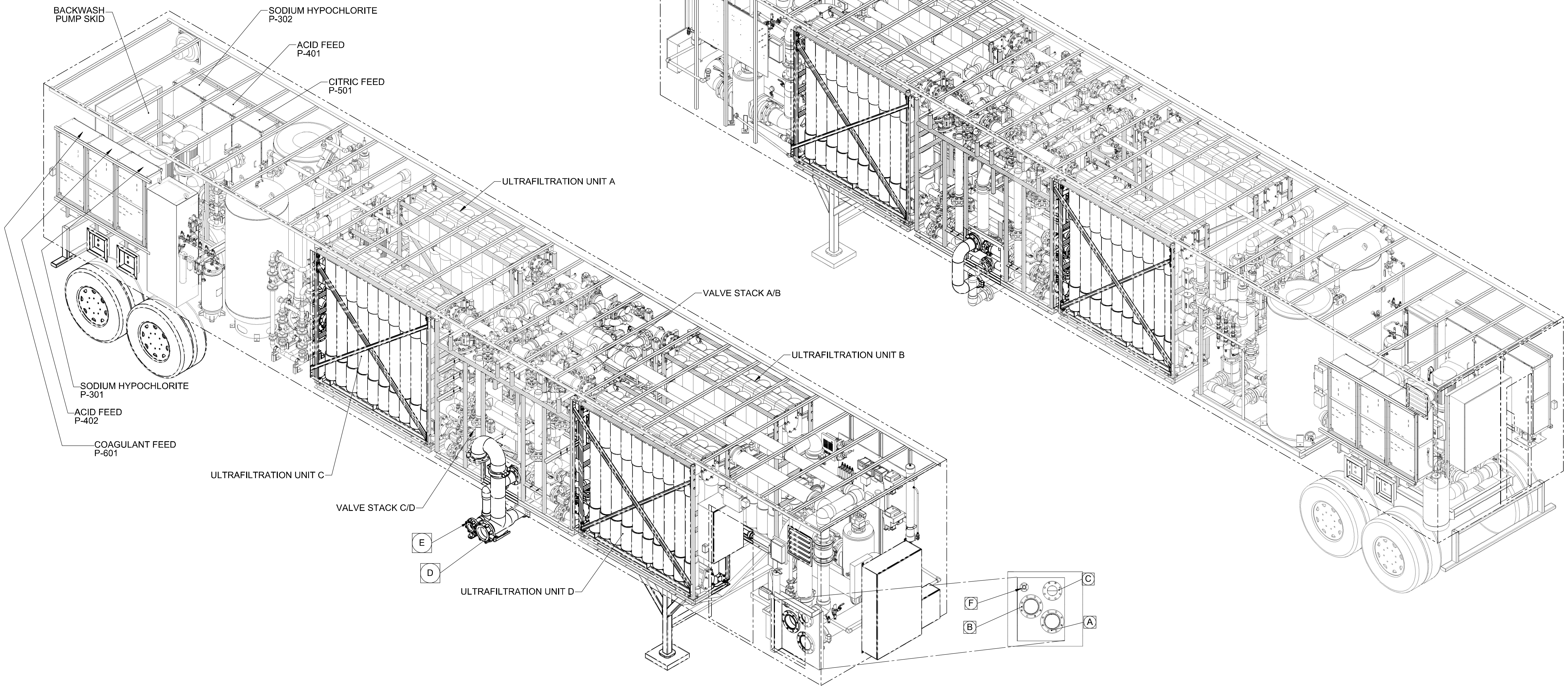
anderson perry
& associates, inc.

engineering surveying natural resources

WALLA WALLA BASIN WATERSHED COUNCIL
CITY OF MILTON-FREEWATER WELL NO. 5
AQUIFER STORAGE AND RECOVERY DEMONSTRATION PROJECT

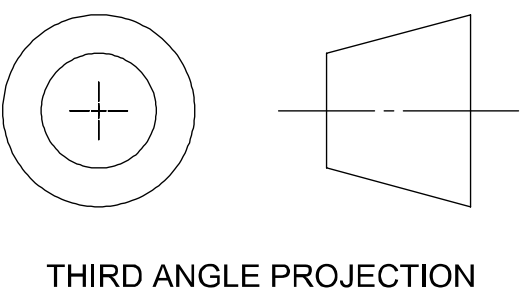
PLC CONNECTION DIAGRAM

- NOTES: UNLESS OTHERWISE SPECIFIED.
1. ALL DIMENSIONS ARE IN INCHES. ALL TOLERANCES ARE +/- 1/2".
 2. BOLT HOLE PATTERN OF FLANGES TO STRADDLE PRINCIPLE CENTERLINE OF PIPE.
 3. ALL GASKETS TO BE EPDM.
 4. ALL CONDUIT TO BE PVC.
 5. ALL MOUNTING HARDWARE TO BE STAINLESS STEEL.
 6. PNEUMATIC TUBING TO BE PE, STATICALLY TESTED TO 80 PSIG.
 7. TAGS ARE LAMICOID WITH WHITE BACKGROUND AND BLACK TEXT, HUNG WITH PLASTIC TIES.
 8. ALL WEIGHTS ASSOCIATED WITH GENERAL ARRANGEMENT DRAWINGS ARE NOMINAL.
 9. ALL MANUAL VALVES TO BE CLOSED PRIOR TO SHIPPING.
 10. ALL INSTRUMENTATION, TIMERS, ETC., SHOULD BE CHECKED FOR PROPER SET-UP AND CALIBRATIONS AT TIME OF START-UP.



CONNECTION POINTS			
CONNECTION	SIZE	TYPE	DESCRIPTION
A	8"	150# FLG SS	INLET, FEED WATER
B	8"	150# FLG SS	OUTLET, FILTERED WATER TO STORAGE
C	6"	150# FLG PVC	INLET, FROM BACKWASH PUMP SKID
D	8"	150# FLG SS	BACKWASH WASTE
E	4"	150# FLG PVC	CEB WASTE
F	1.5"	150# FLG SS	INLET COMPRESSED AIR

GENERAL ARRANGEMENT SPECIFICATIONS	
TRAILER LENGTH	54' - 03"
TRAILER WIDTH	102 3/8"
TRAILER HEIGHT	108-1/2" (EXCLUDE WHEELS)



STD: BORDER-0106-22X34D

INTL REFINTR_REF_NO

PRINT NOT TO SCALE

REV	DESCRIPTION	DATE	DWN	CHKD	APVD	ECN
1	UPDATED CONNECTION BOX LOCATIONS	1/4/2018	JAB	DRA	DRA	
0	ISSUE FOR CONSTRUCTION	6/9/17	JAB	DRA	DRA	

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DESIGNER	DATE
JAB	1/27/17
CHECKER	DATE
DRA	1/27/17
ENGINEER	DATE
DRA	1/27/17
MANAGER	DATE
SL	1/27/17

TITLE GENERAL ARRANGEMENT TRAILER, UF SKID (MEMCOR)

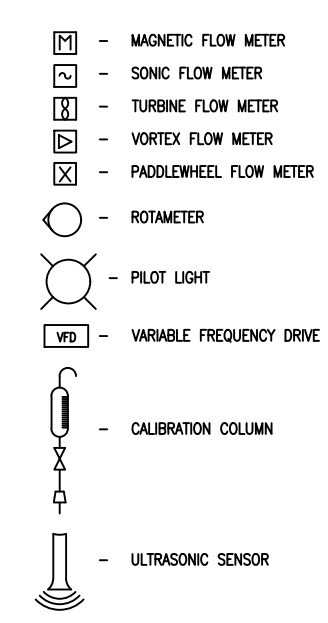
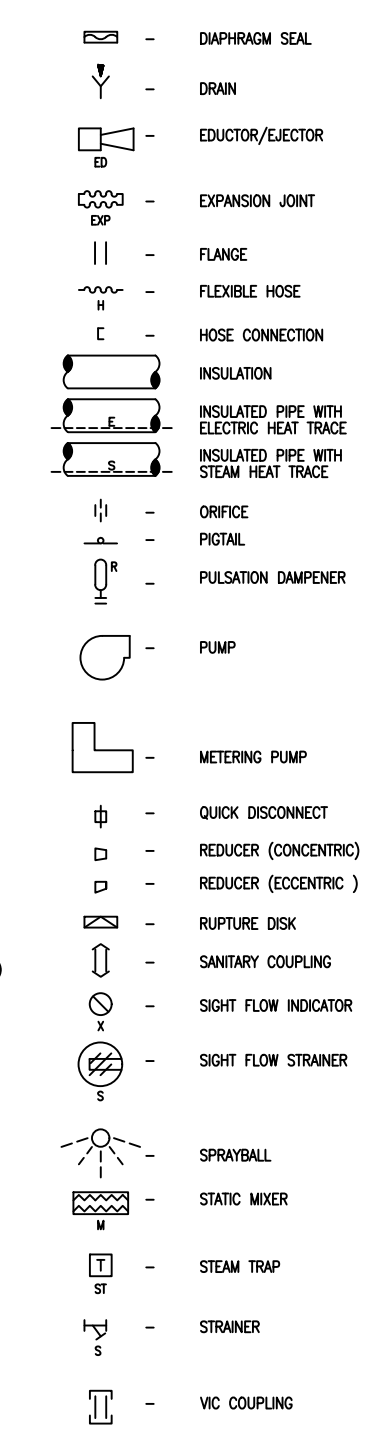
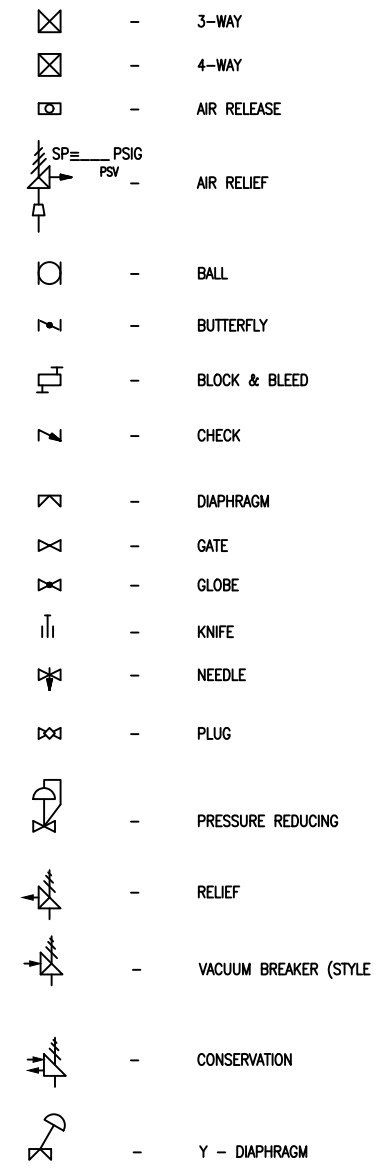
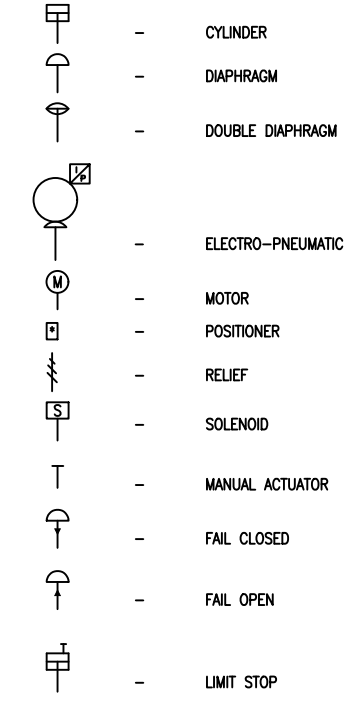
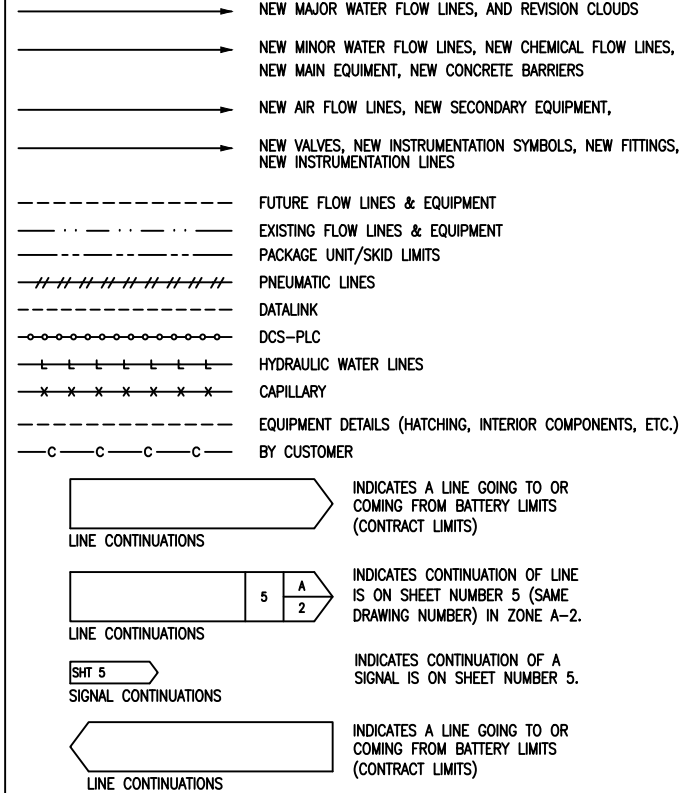
CLIENT EVOQUA WATER TECHNOLOGIES COLORADO SPRINGS, CO

evoqua WATER TECHNOLOGIES COLORADO SPRINGS, CO 719-570-9600

PROJECT	SAP NUMBER	DRAWING	SHEET	REV
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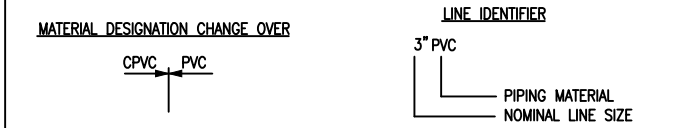
SCALE: 1:30

8 FLOWS & LINES 7 ACTUATOR SYMBOLS 6 VALVE SYMBOLS 5 PIPING ACCESSORIES 4 INSTRUMENTATION, ELECTRICAL AND RELATED ITEMS 3 2 1



	PRIMARY LOCATION NORMALLY ACCESSIBLE TO OPERATOR (IE: LOCAL PANEL MOUNTED)	FIELD MOUNTED (IE: PIPE MOUNTED)	AUXILIARY LOCATION NORMALLY ACCESSIBLE TO OPERATOR (IE: REMOTE PANEL MOUNTED)	LOCATION NORMALLY INACCESSIBLE TO OPERATOR (IE: MOUNTED INSIDE PANEL)	BY OTHERS**
DISCRETE INSTRUMENTS	1	2	3	4	5
SHARED DISPLAY, SHARED CONTROL	6	7	8	9	10
COMPUTER FUNCTION	11	12	13	14	15
PROGRAMMABLE LOGIC CONTROL	16	17	18	19	20

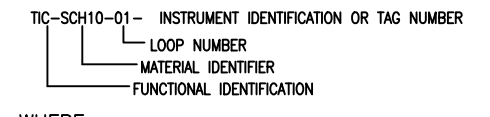
* ABBREVIATIONS OF THE USER'S CHOICE SUCH AS IP1 (INSTRUMENT PANEL #1), IC2 (INSTRUMENT CONSOLE #2), CC3 (COMPUTER CONSOLE #3), ETC., MAY BE USED WHEN IT IS NECESSARY TO SPECIFY INSTRUMENT OR FUNCTION LOCATION.
 ** PRIMARY LOCATION SYMBOL FOR EACH INSTRUMENT TYPE IS SHOWN AS AN EXAMPLE OF "BY OTHERS"
 *** AI,AO,DI,DO



ABBREVIATIONS

B - BLOWER OR AIR HANDLING	OD - OUTSIDE DIAMETER
CDI - CONTINUOUS DEIONIZATION CELL PACK	OZ - OZONE GENERATOR
CFM - CUBIC FEET PER MINUTE	P - PUMP
CS - CARBON STEEL	PE - POLYETHYLENE
CW - CITY WATER (POTABLE)	PP - POLYPROPYLENE
DA - STEAM DEAERATOR	PSIA - POUNDS PER SQUARE INCH - ABSOLUTE
DIA - DIAMETER	PSID - POUNDS PER SQUARE INCH - DIFFERENTIAL
DWG - DRAWING	PSIG - POUNDS PER SQUARE INCH - GAUGE
EPSS - ELECTRO POLISHED STAINLESS STEEL	PVC - POLY VINYL CHLORIDE
F - FILTER VESSEL (CARTRIDGE, MEDIA, CARBON, PRECOAT, AIR)	PVDF - POLYVINYLIDENE FLUORIDE
FC - FAIL CLOSED	PW - PLANT WATER
FDD - FORCED DRAFT DECARBONATOR VESSEL	RO - REVERSE OSMOSIS
FO - FAIL OPEN	RPM - REVOLUTIONS PER MINUTE
FRP - FIBERGLASS REINFORCED PLASTIC	SB - SPRAYBALL
GAL - GALLONS	SCFM - STANDARD CUBIC FEET PER MINUTE
GPD - GALLONS PER DAY	SCH - SCHEDULE
GPH - GALLONS PER HOUR	SG - SPECIFIC GRAVITY
GPM - GALLONS PER MINUTE	SP - SETPOINT
HG - INCHES OF MERCURY	SS - STAINLESS STEEL
HOA - HAND/OFF/AUTO	SSH - STRAIGHT SIDE HEIGHT
HP - HORSEPOWER	SST - STAINLESS STEEL TUBE
HDPE - HIGH DENSITY XXX XXX	SW - SEAL WATER
HX - HEAT EXCHANGER	T - TANK (LIQUID OR CHEMICAL STORAGE, NEUTRALIZATION)
IA - INSTRUMENT AIR	TDH - TOTAL DYNAMIC HEAD (FEET OF FLUID)
ID - INSIDE DIAMETER	TYP - TYPICAL
IX - ION EXCHANGER	UF - ULTRAFILTER MODULE
M - MIXER (AGITATOR, AERATOR)	UV - ULTRAVIOLET LIGHT (STERILIZER, TOC OR O3 REMOVAL)
MD - MEMBRANE DEGASIFIER CONTACTOR	VAC - VACUUM
MMF - MULTI-MEDIA FILTER	VD - VACUUM DEGASIFIER VESSEL
MOC - MATERIAL OF CONSTRUCTION	VFD - VARIABLE FREQUENCY DRIVE
NW - MANWAY	WC - WATER COLUMN
NO - NORMALLY OPEN	
NC - NORMALLY CLOSED	
NF - NANOFILTER	

INSTRUMENT TAG NUMBERS



WHERE: (LEGEND BASED ON ISA STANDARD S 5.1)

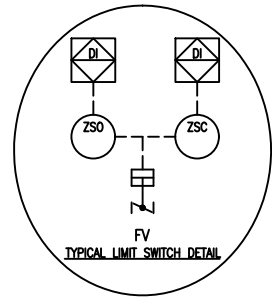
ISA INSTRUMENT IDENTIFICATION TABLE			
	FIRST LETTER		SUCCEEDING LETTERS
	PROCESS VARIABLE	MODIFIER (IF NEEDED)	READOUT OR COMPUTER FUNCTION MODIFIER (IF NEEDED)
A	ANALYSIS		ALARM
B	BURNER, COMBUSTION		USER'S CHOICE
C	USER'S CHOICE		CONTROL
D	USER'S CHOICE	DIFFERENTIAL	
E	VOLTAGE		SENSOR (PRIMARY ELEMENT)
F	FLOW RATE	RATIO (FRACTION)	
G	USER'S CHOICE		GLASS, VIEWING DEVICE
H	HAND		HIGH
I	CURRENT (ELECTRICAL)		INDICATE
J	POWER	SCAN	
K	TIME, TIME SCHEDULE	TIME RATE OF CHANGE	CONTROL STATION
L	LEVEL		LIGHT
M	USER'S CHOICE	MOMENTARY	MIDDLE, INTERMEDIATE
N	USER'S CHOICE		USER'S CHOICE
O	USER'S CHOICE		ORIFICE (RESTRICTION)
P	PRESSURE, VACUUM		POINT (TEST CONNECTION)
Q	QUANTITY	INTEGRATE, TOTALIZE	
R	RADIATION		RECORD
S	SPEED, FREQUENCY	SAFETY	SWITCH
T	TEMPERATURE		TRANSMIT
U	MULTIVARIABLE		MULTIFUNCTION
V	VIBRATION, MECH. ANALYSIS		VALVE, DAMPER, LOUVER
W	WEIGHT, FORCE		WELL
X	UNCLASSIFIED	X-AXIS	UNCLASSIFIED
Y	EVENT, STATE OR PRESENCE	Y-AXIS	RELAY, COMPUTE, CONVERT
Z	POSITION, DIMENSION	Z-AXIS	DRIVER, ACTUATOR, UNCLASSIFIED FINAL CONTROL ELEMENT

REV	DESCRIPTION	DATE	DWN	CHKD	APVD	ECH	COMPANY CONFIDENTIAL	DESIGNER	DATE	TITLE
4	ENGINEERING CHANGES	4/20/18	DRA	KW	JT		THIS DOCUMENT AND ALL INFORMATION CONTAINED HEREIN ARE THE PROPERTY OF EVOQUA AND/OR ITS AFFILIATES. THE DESIGN CONCEPTS AND INFORMATION CONTAINED HEREIN ARE PROPRIETARY TO EVOQUA AND ARE SUBMITTED IN CONFIDENCE. THEY ARE NOT TO BE REPRODUCED, COPIED, OR USED IN ANY MANNER WITHOUT THE EXPRESS WRITTEN CONSENT OF EVOQUA. IN NO EVENT SHALL THEY BE USED IN ANY MANNER DETRIMENTAL TO THE INTEREST OF EVOQUA. ALL PATENT RIGHTS ARE RESERVED. UPON THE DEMAND OF EVOQUA, THIS DOCUMENT, ALONG WITH ALL COPIES AND EXTENTS, AND ALL RELATED NOTES AND ANALYSES, MUST BE RETURNED TO EVOQUA OR DESTROYED, AS INSTRUCTED BY EVOQUA. ACCEPTANCE OF THE DELIVERY OF THIS DOCUMENT CONSTITUTES AGREEMENT TO THESE TERMS.	DRA	12/1/16	PROCESS AND INSTRUMENTATION DIAGRAM LEGEND SHEET ONE
3	ENGINEERING CHANGES	2/22/18	DRA	KW	JT			JMP	12/1/16	UF TRAILER - MEMCOR UF
2	ENGINEERING CHANGES	5/10/17	DRA	JMP	ZW			ENGINEER	12/1/16	EVOQUA ROCKFORD, IL
1	ENGINEERING CHANGES	1/17/17	DRA	JMP	ZW			MANAGER	12/1/16	
0	RELEASE FOR CONSTRUCTION	12/9/16	DRA	JMP	ZW			FILE: 2016/1/16/000-9100_0	12/1/16	

STD: BORDER-0106-24X36D1 INTL REF: BAR = 1" AT PLOT SCALE PROJECT: UFM000 CODE: DRAWING: 9100 SHEET: 1 OF 18 REV: 4

PUMP DIAGRAM NOTES:

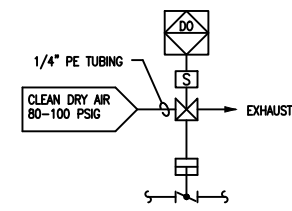
1. HAND-OFF-AUTO (H-O-A) COULD BE REPLACED BY HAND-OFF (H-O).
2. MOTOR CONTROL CENTER (MCC), MOTOR STARTER (MS), VARIABLE FREQUENCY DRIVE (VFD) OR DISCONNECT SWITCH (DS) COULD BE BY CUSTOMER OR EVOQUA WATER TECHNOLOGIES.
3. ZS INDICATES VOLUME ADJUSTMENT, EITHER FREQUENCY OR STROKE LENGTH. EXAMPLE INDICATES ADJUSTMENT FROM THE PLC.
4. THE POSITIVE DISPLACEMENT PUMP CAN HAVE THE SAME COMBINATIONS AS SHOWN FOR THE CENTRIFUGAL PUMP.



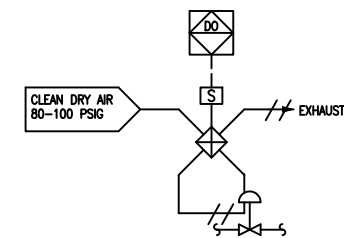
ZSO
ZSC ← AS SHOWN IN P & ID

AUTO VALVE ACTUATORS

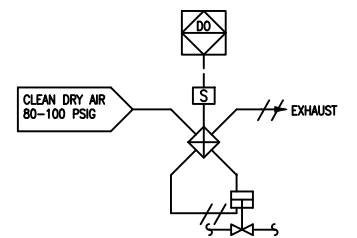
- CYLINDER ACTUATOR - DOUBLE ACTING (FAIL INDETERMINANT)
- CYLINDER ACTUATOR - SPRING RETURN (FAIL CLOSED)
- CYLINDER ACTUATOR - SPRING RETURN (FAIL OPEN)
- DIAPHRAGM ACTUATOR - DOUBLE ACTING (FAIL OPEN)
- DIAPHRAGM ACTUATOR - SPRING RETURN (FAIL CLOSED)
- DIAPHRAGM ACTUATOR - SPRING RETURN (FAIL OPEN)
- MANUAL OVERRIDE OR HANDWHEEL



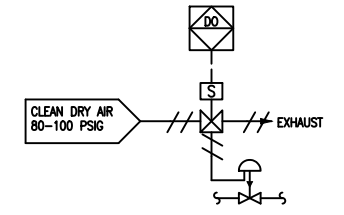
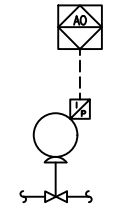
TYPICAL AIR ACTUATED VALVE CONTROL DETAIL (AIR SUPPLY NOT SHOWN ON SYSTEM P&ID)



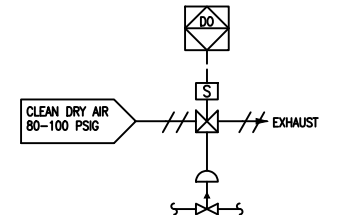
TYPICAL VALVE SCHEMATIC FOR ALL VALVES W/AIR TO AIR DIAPHRAGM ACTUATOR



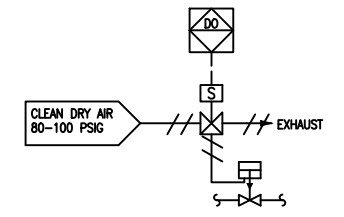
TYPICAL VALVE SCHEMATIC FOR ALL VALVES W/AIR TO AIR CYLINDER ACTUATOR



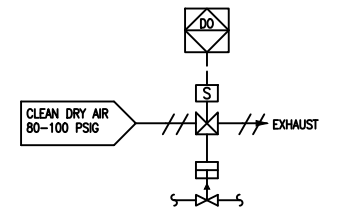
TYPICAL VALVE SCHEMATIC FOR ALL VALVES W/SPRING TO CLOSE DIAPHRAGM ACTUATOR



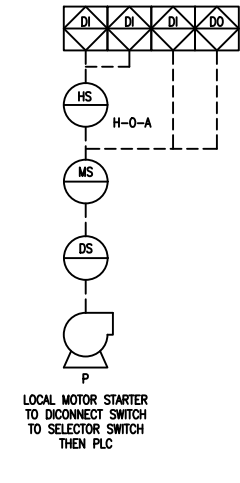
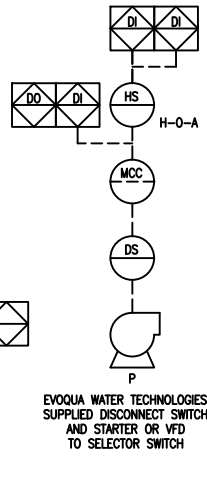
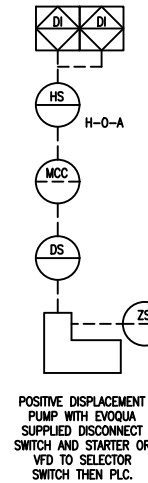
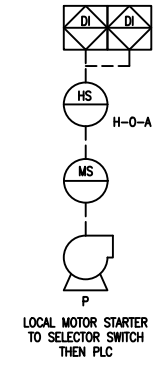
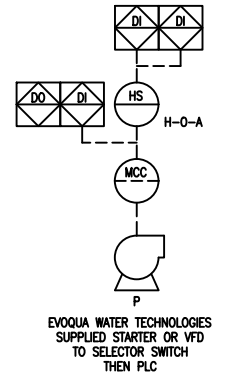
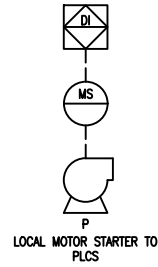
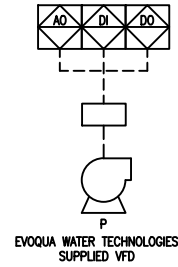
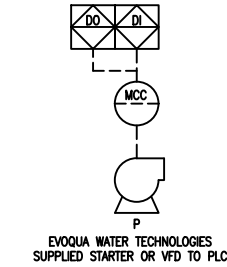
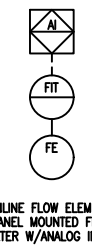
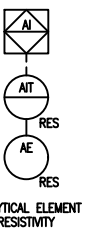
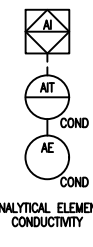
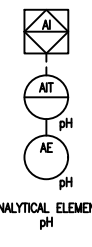
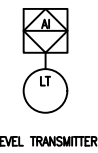
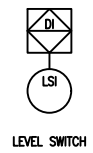
TYPICAL VALVE SCHEMATIC FOR ALL VALVES W/SPRING TO OPEN DIAPHRAGM ACTUATOR



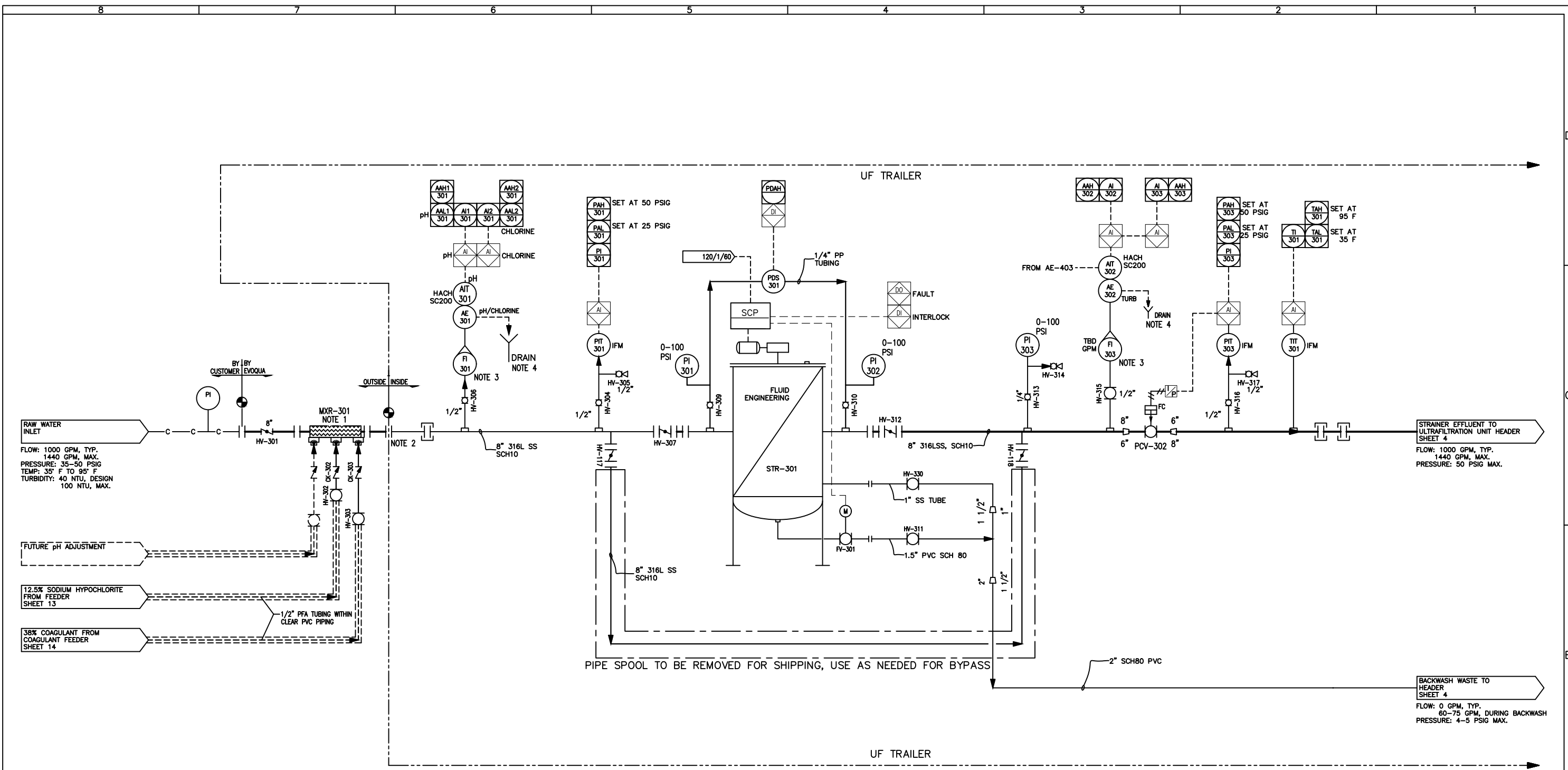
TYPICAL VALVE SCHEMATIC FOR ALL VALVES W/SPRING TO CLOSE CYLINDER ACTUATOR



TYPICAL VALVE SCHEMATIC FOR ALL VALVES W/SPRING TO OPEN CYLINDER ACTUATOR



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<p>CLIENT EVOQUA ROCKFORD, IL</p>										<p>ENGINEER JMP 12/1/16</p>	<p>DATE 12/1/16</p>	<p>MANAGER ZW 12/1/16</p>	
<p>PROJECT UFM000</p>										<p>CODE 9100</p>	<p>DRAWING 9100</p>	<p>SHEET 2 OF 18</p>	<p>REV 4</p>
<p>STD: BORDER-0106-24X36D1</p>	<p>INTL REF:</p>	<p>BAR = 1" AT PLOT SCALE</p>	<p>REV - SEE SHEET ONE</p>	<p>DESCRIPTION</p>	<p>DATE</p>	<p>DWN</p>	<p>CHKD</p>	<p>APVD</p>	<p>ECN</p>				



RAW WATER INLET
 FLOW: 1000 GPM, TYP.
 1440 GPM, MAX.
 PRESSURE: 35-50 PSIG
 TEMP: 35° F TO 95° F
 TURBIDITY: 40 NTU, DESIGN
 100 NTU, MAX.

FUTURE pH ADJUSTMENT
 12.5% SODIUM HYPOCHLORITE FROM FEEDER SHEET 13
 38% COAGULANT FROM COAGULANT FEEDER SHEET 14

STR-301
 AUTOMATIC STRAINER
 SIZE: 8" INLET & OUTLET, 250 MICRON
 PRESSURE RATING: 150 PSIG, ASME CODE
 MATL: CARBON STEEL LINING: EPOXY
 SS SCREEN
 FLUID ENGINEERING
 MODEL: 08008-753

- NOTES:
1. MAXIMIZE PIPE RUN DISTANCE BETWEEN STATIC MIXER AND UF TRAILER TO OBTAIN AT LEAST 30 SECONDS OF CONTACT TIME. (GREATER THAN 200 FT, IF POSSIBLE.)
 2. TRAILER CONNECTION BOX, FRONT CURB SIDE LOCATION
 3. FLOWMETERS HAVE INTEGRAL NEEDLE VALVE.
 4. 2" PVC SCH 80 PIPE DRAIN TO SUMP TANK

STD: BORDER-0106-24X36D1 INTL REF:

BAR = 1" AT PLOT SCALE

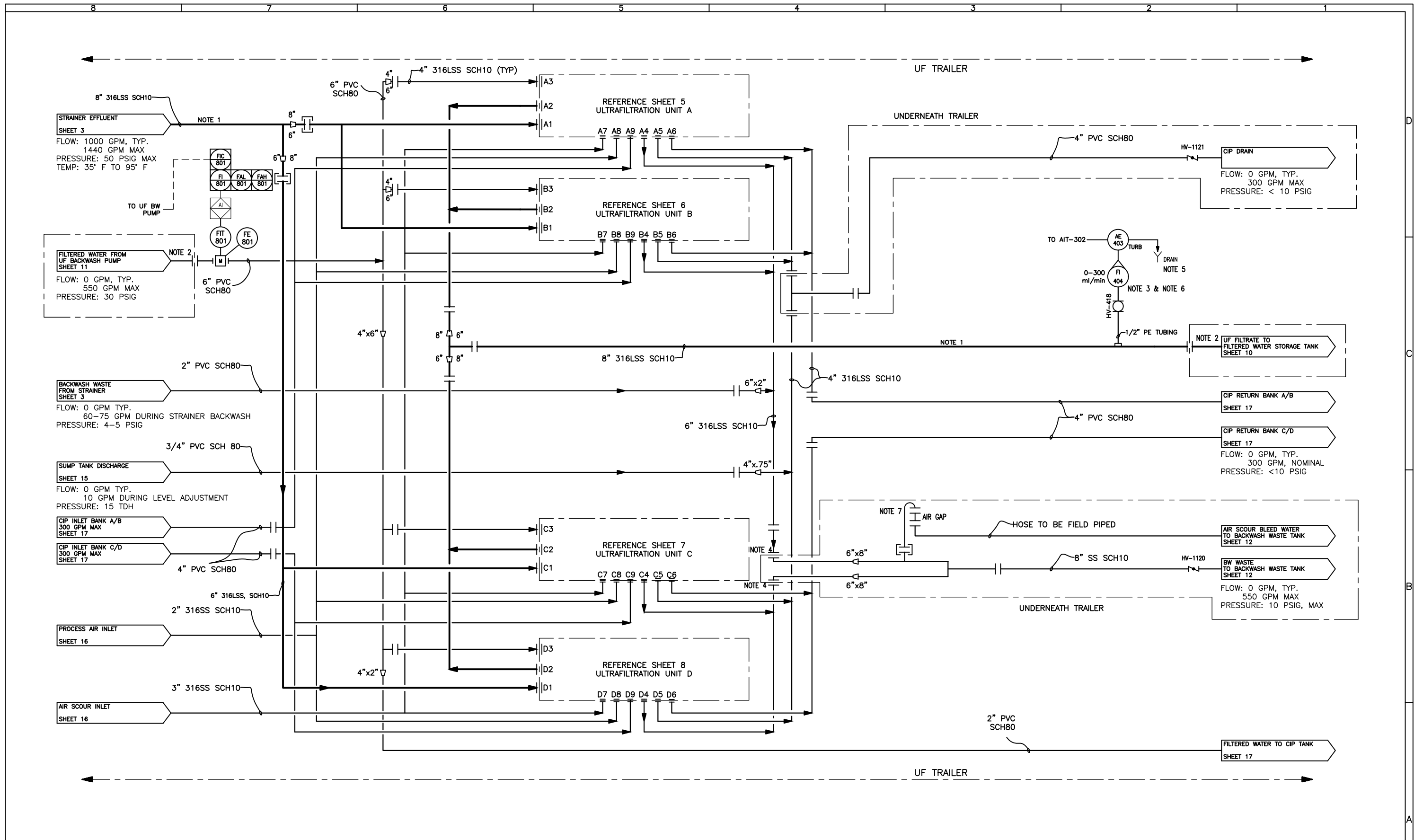
REV	DESCRIPTION	DATE	DWN	CHKD	APVD	ECN
-	SEE SHEET ONE					

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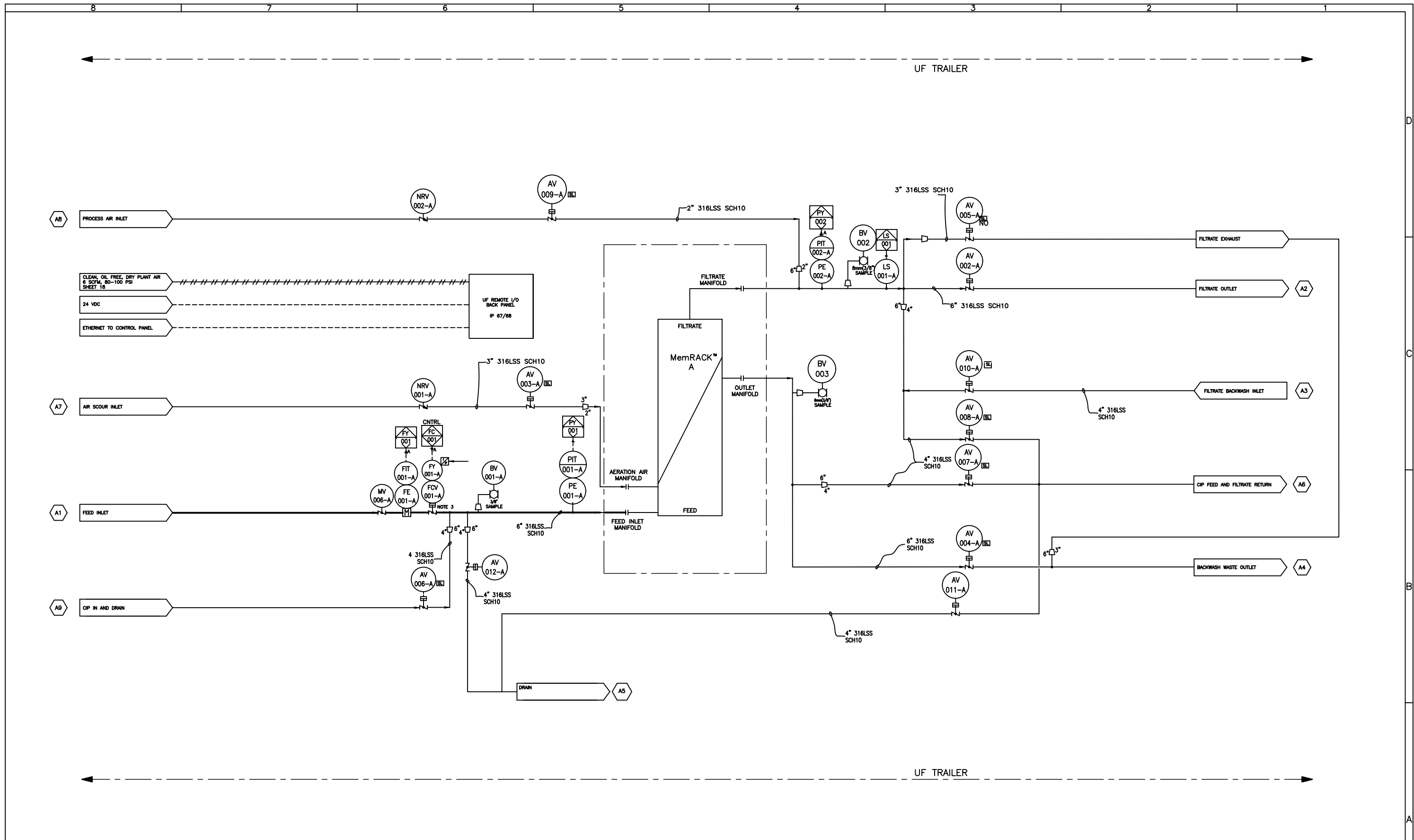
DESIGNER: DRA 12/1/16
 CHECKER: JNP 12/1/16
 ENGINEER: DRA 12/1/16
 MANAGER: ZW 12/1/16
 FILE: 2016/UFM000-9100-0
 SCALE: NONE

PROJECT	CODE	DRAWING	SHEET	REV
UFM000		9100	3 OF 18	4

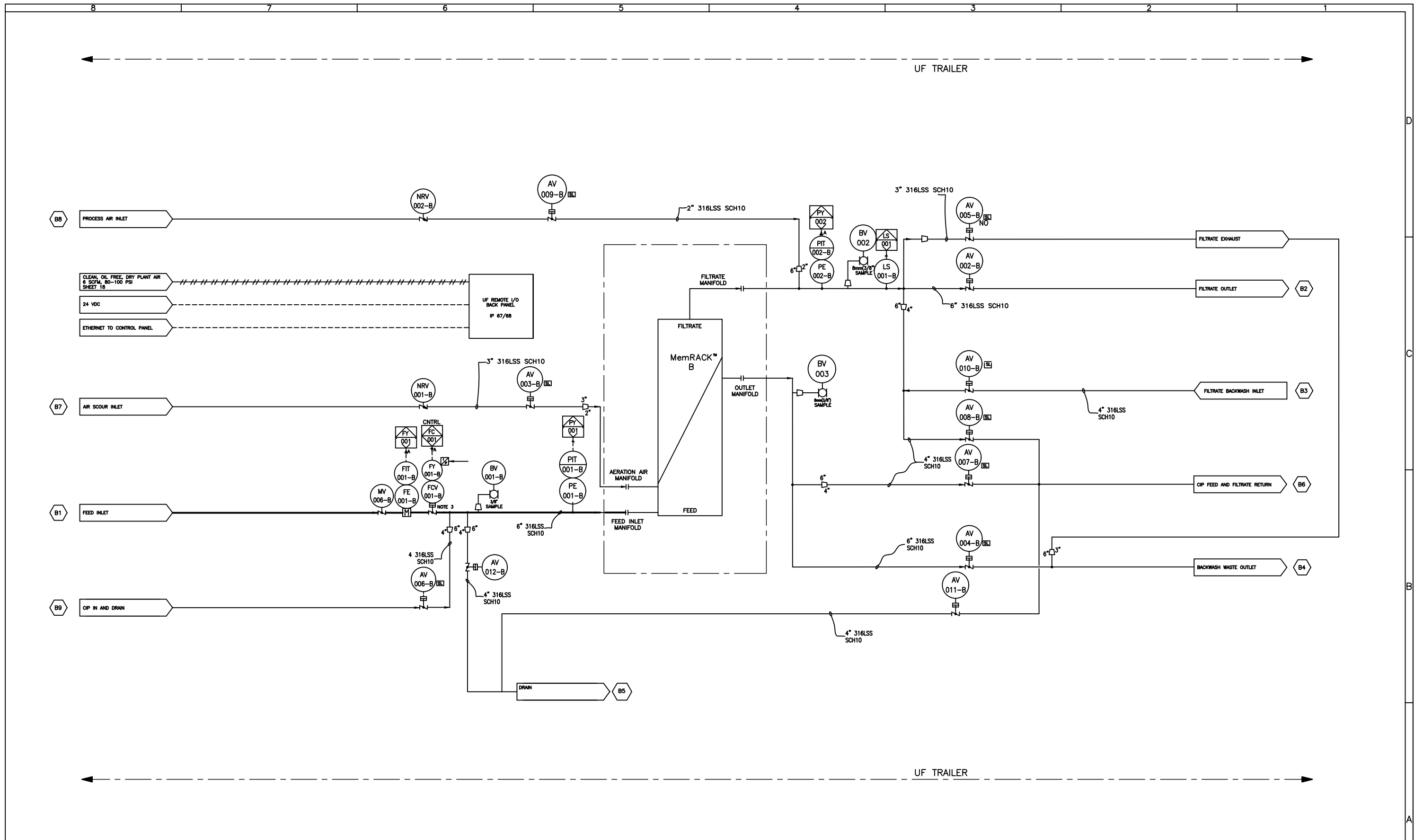
TITLE: PROCESS AND INSTRUMENTATION DIAGRAM
 AUTO BACKWASH STRAINER
 UF TRAILER - MEMCOR UF
 CLIENT: EVOQUA
 ROCKFORD, IL
 WATER TECHNOLOGIES
 COLORADO SPRINGS, CO
 719-570-9600



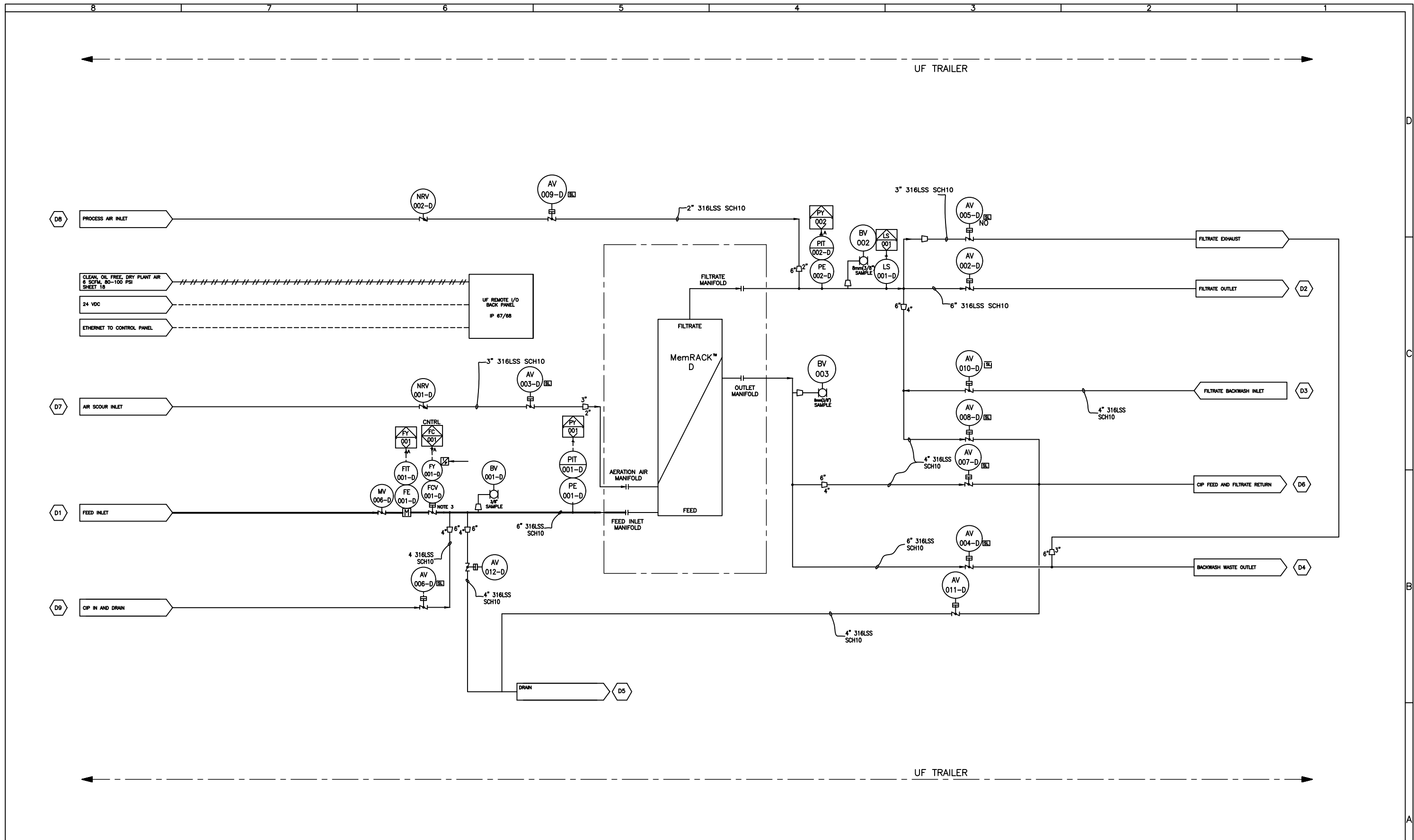
NOTES: 1. VCTAILIC CONNECTIONS (NOT SHOWN) ARE TO AID IN THE ASSEMBLY/DISASSEMBLY OF THE PIPING MANIFOLDS. 2. TRAILER CONNECTION BOX, FRONT CURB SIDE LOCATION. 3. FLOWMETERS HAVE INTEGRAL NEEDLE VALVE. 4. DRAIN CONNECTION BOX, SIDE CS & SS LOCATIONS TIED TOGETHER UNDER TRAILER. 5. 2" PVC SCH80 PIPE DRAIN TO SUMP TANK. 6. TURBIDITY METER TO INCLUDE BUBBLE TRAP. 7. BACKWASH AIR SCOUR BLEED LINE TO HAVE AIR GAPS AT TRAILER CONNECTION.		COMPANY CONFIDENTIAL THIS DOCUMENT AND ALL INFORMATION CONTAINED HEREIN ARE THE PROPERTY OF EVOQUA AND/OR ITS AFFILIATES. THE DESIGN CONCEPTS AND INFORMATION CONTAINED HEREIN ARE PROPRIETARY TO EVOQUA AND ARE SUBMITTED IN CONFIDENCE. THEY ARE NOT TO BE REPRODUCED, COPIED, LOANED, OR USED IN ANY MANNER WITHOUT THE EXPRESS WRITTEN CONSENT OF EVOQUA. IN NO EVENT SHALL THEY BE USED IN ANY MANNER DETRIMENTAL TO THE INTEREST OF EVOQUA. ALL PATENT RIGHTS ARE RESERVED. UPON THE DEMAND OF EVOQUA, THIS DOCUMENT, ALONG WITH ALL COPIES AND EXTRACTS, AND ALL RELATED NOTES AND ANALYSES, MUST BE RETURNED TO EVOQUA OR DESTROYED AS INSTRUCTED BY EVOQUA. ACCEPTANCE OF THE DELIVERY OF THIS DOCUMENT CONSTITUTES AGREEMENT TO THESE TERMS.		DESIGNER: DRA DATE: 12/1/16 CHECKER: JNP DATE: 12/1/16 ENGINEER: ZW DATE: 12/1/16 MANAGER: ZW DATE: 12/1/16 FILE: 2016/UFM000-9100-0 SCALE: NONE	TITLE: PROCESS AND INSTRUMENTATION DIAGRAM OF UNITS UF TRAILERS - MEMCOR UF CLIENT: EVOQUA ROCKFORD, IL WATER TECHNOLOGIES COLORADO SPRINGS, CO 719-570-9600
STD: BORDER-0106-24X36D1 INTL REF:	BAR = 1" AT PLOT SCALE	- SEE SHEET ONE	REV: [] DESCRIPTION: [] DATE: [] DWN: [] CHKD: [] APVD: [] ECR: []	PROJECT: UFM000 CODE: [] DRAWING: 9100 SHEET: 4 OF 18 REV: 4	



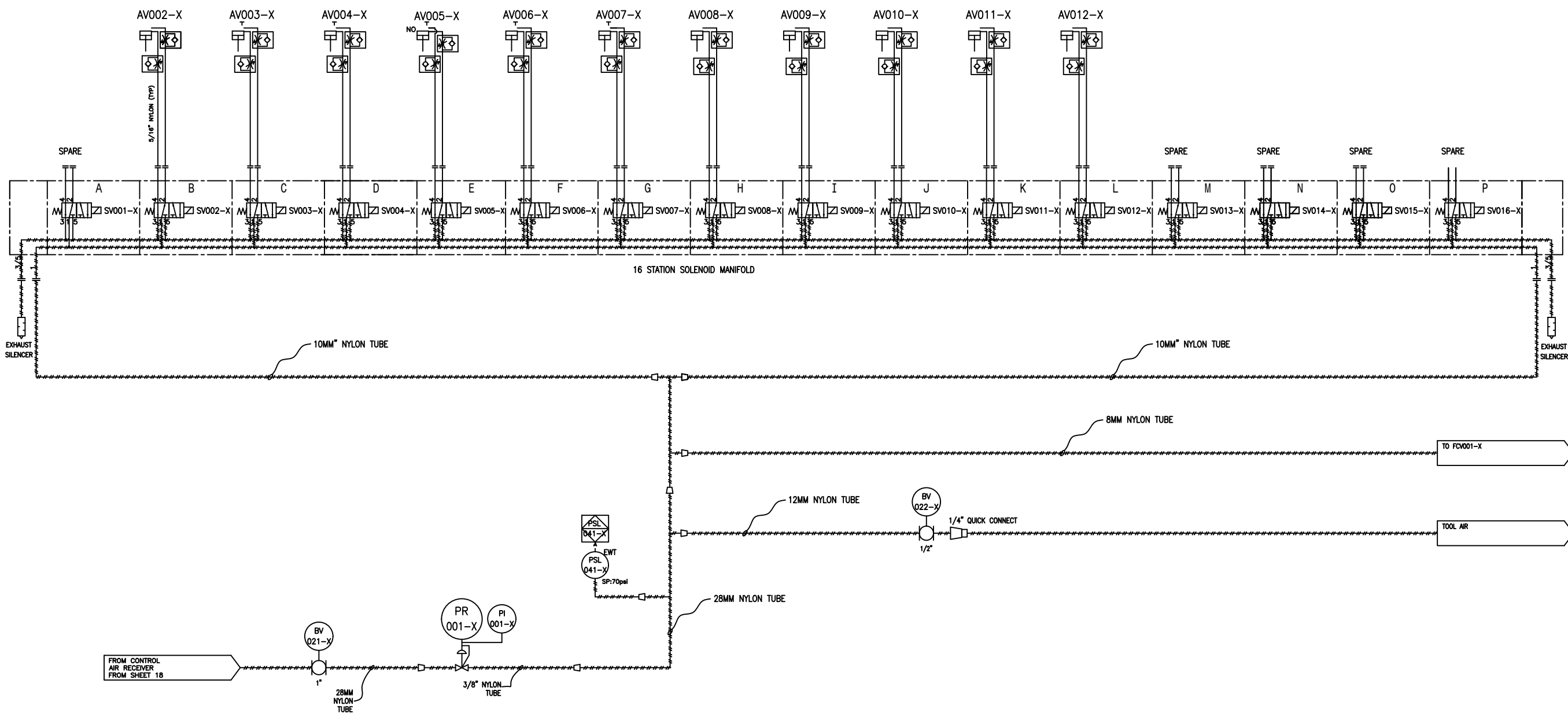
STD: BORDER-0106-24X36D1	INTL REF:	BAR = 1" AT PLOT SCALE	REV	DESCRIPTION	DATE	DWN	CHKD	APVD	ECN	COMPANY CONFIDENTIAL THIS DOCUMENT AND ALL INFORMATION CONTAINED HEREIN ARE THE PROPERTY OF EVOQUA AND/OR ITS AFFILIATES. THE DESIGN CONCEPTS AND INFORMATION CONTAINED HEREIN ARE PROPRIETARY TO EVOQUA AND ARE SUBMITTED IN CONFIDENCE. THEY ARE NOT TO BE REPRODUCED, COPIED, LOANED, OR USED IN ANY MANNER WITHOUT THE EXPRESS WRITTEN CONSENT OF EVOQUA. IN NO EVENT SHALL THEY BE USED IN ANY MANNER DETRIMENTAL TO THE INTEREST OF EVOQUA. ALL PATENT RIGHTS ARE RESERVED. UPON THE DEMAND OF EVOQUA, THIS DOCUMENT, ALONG WITH ALL COPIES AND EXTRACTS, AND ALL RELATED NOTES AND ANALYSES, MUST BE RETURNED TO EVOQUA OR DESTROYED AS INSTRUCTED BY EVOQUA. ACCEPTANCE OF THE DELIVERY OF THIS DOCUMENT CONSTITUTES AGREEMENT TO THESE TERMS.	DESIGNER DRA 12/1/16	DATE 12/1/16	TITLE PROCESS AND INSTRUMENTATION DIAGRAM CPII TRAILER UNIT A UF TRAILER - MEMCOR UF		
											CHECKER JMP 12/1/16	ENGINEER DRA 12/1/16	MANAGER ZW 12/1/16	CLIENT EVOQUA ROCKFORD, IL	
											WATER TECHNOLOGIES COLORADO SPRINGS, CO 719-570-9600				
											PROJECT UFM000	CODE 9100	DRAWING 9100	SHEET 5 OF 18	REV 4



STD: BORDER-0106-24X36D1	INTL REF:	BAR = 1" AT PLOT SCALE	REV	DESCRIPTION	DATE	DWN	CHKD	APVD	ECN	COMPANY CONFIDENTIAL THIS DOCUMENT AND ALL INFORMATION CONTAINED HEREIN ARE THE PROPERTY OF EVOQUA AND/OR ITS AFFILIATES. THE DESIGN CONCEPTS AND INFORMATION CONTAINED HEREIN ARE PROPRIETARY TO EVOQUA AND ARE SUBMITTED IN CONFIDENCE. THEY ARE NOT TO BE REPRODUCED, COPIED, LOANED, OR USED IN ANY MANNER WITHOUT THE EXPRESS WRITTEN CONSENT OF EVOQUA. IN NO EVENT SHALL THEY BE USED IN ANY MANNER DETRIMENTAL TO THE INTEREST OF EVOQUA. ALL PATENT RIGHTS ARE RESERVED. UPON THE DEMAND OF EVOQUA, THIS DOCUMENT, ALONG WITH ALL COPIES AND EXTRACTS, AND ALL RELATED NOTES AND ANALYSES, MUST BE RETURNED TO EVOQUA OR DESTROYED AS INSTRUCTED BY EVOQUA. ACCEPTANCE OF THE DELIVERY OF THIS DOCUMENT CONSTITUTES AGREEMENT TO THESE TERMS.	DESIGNER DRA 12/1/16	DATE 12/1/16	TITLE PROCESS AND INSTRUMENTATION DIAGRAM CPII TRAILER UNIT B UF TRAILER - MEMCOR UF		
											CHECKER JMP 12/1/16	ENGINEER DRA 12/1/16	MANAGER ZW 12/1/16	CLIENT EVOQUA ROCKFORD, IL	
											WATER TECHNOLOGIES COLORADO SPRINGS, CO 719-570-9600				
											PROJECT UFM000	CODE 	DRAWING 9100	SHEET 6 OF 18	REV 4

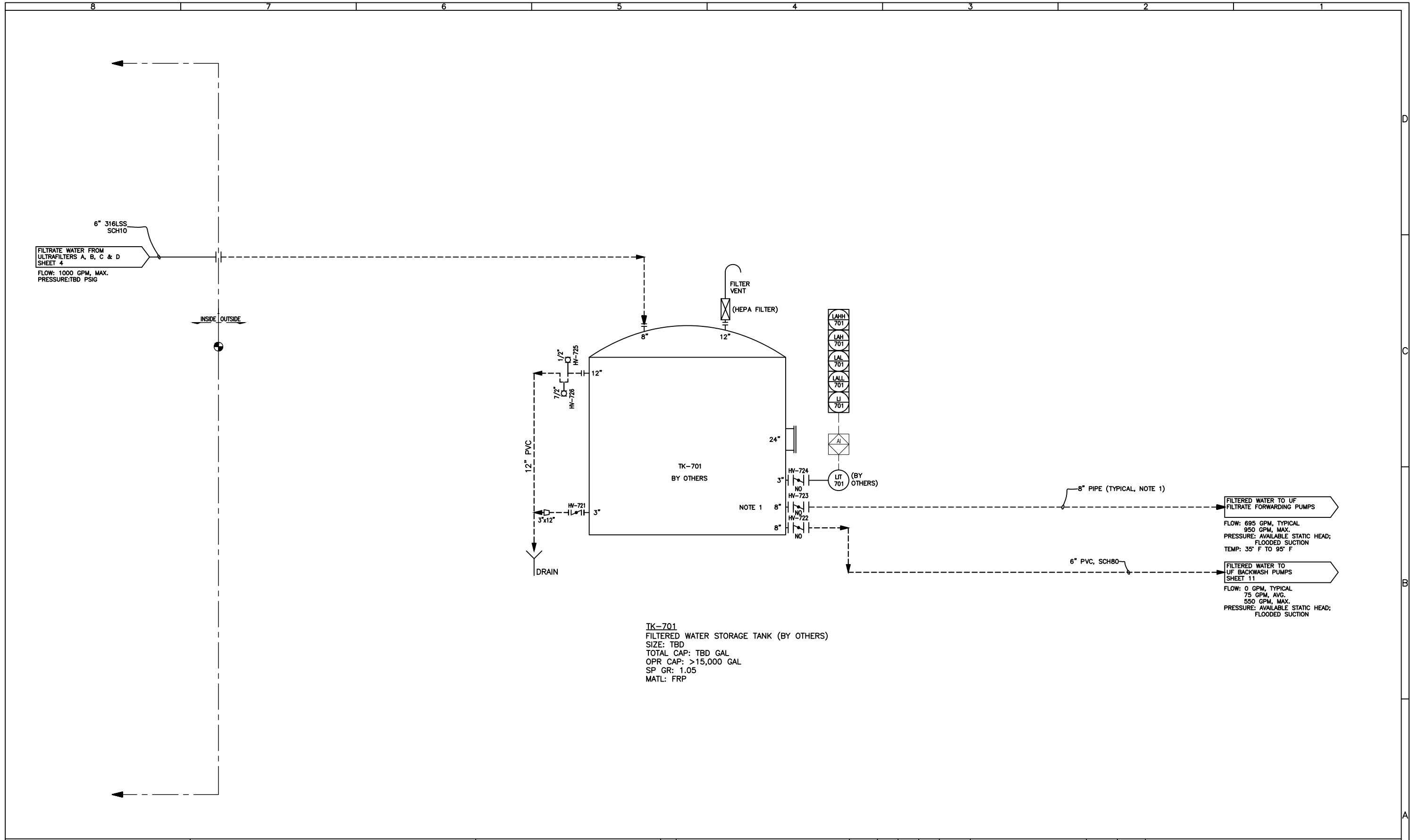


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											CHECKER JMP 12/1/16	ENGINEER DRA 12/1/16	MANAGER ZW 12/1/16	CLIENT EVOQUA ROCKFORD, IL		
										WATER TECHNOLOGIES COLORADO SPRINGS, CO 719-570-9600		PROJECT UFM000	CODE 	DRAWING 9100	SHEET 8 OF 18	REV 4



TYPICAL FOR UF CPII UNITS A, B, C, & D
SHEETS 5-8

STD: BORDER-0106-24X36D1	INTL REF:	BAR = 1" AT PLOT SCALE	REV	DESCRIPTION	DATE	DWN	CHKD	APVD	ECN	COMPANY CONFIDENTIAL THIS DOCUMENT AND ALL INFORMATION CONTAINED HEREIN ARE THE PROPERTY OF EVOQUA AND/OR ITS AFFILIATES. THE DESIGN CONCEPTS AND INFORMATION CONTAINED HEREIN ARE PROPRIETARY TO EVOQUA AND ARE SUBMITTED IN CONFIDENCE. THEY ARE NOT TRANSFERABLE AND MUST BE USED ONLY FOR THE PURPOSE FOR WHICH THE DOCUMENT IS EXPRESSED. LOANED, REPRODUCED, LOANED OR USED IN ANY OTHER MANNER WITHOUT THE EXPRESS WRITTEN CONSENT OF EVOQUA. IN NO EVENT SHALL THEY BE USED IN ANY MANNER DETRIMENTAL TO THE INTEREST OF EVOQUA. ALL PATENT RIGHTS ARE RESERVED. UPON THE DEMAND OF EVOQUA, THIS DOCUMENT, ALONG WITH ALL COPIES AND EXTRACTS, AND ALL RELATED NOTES AND ANALYSES, MUST BE RETURNED TO EVOQUA OR DESTROYED AS INSTRUCTED BY EVOQUA. ACCEPTANCE OF THE DELIVERY OF THIS DOCUMENT CONSTITUTES AGREEMENT TO THESE TERMS.	DESIGNER DRA	DATE 12/1/16	TITLE PROCESS AND INSTRUMENTATION DIAGRAM CPII TRAILER UNIT UF TRAILER - MEMCOR UF	
											CHECKER JMP	DATE 12/1/16		CLIENT EVOQUA ROCKFORD, IL
											ENGINEER DRA	DATE 12/1/16	PROJECT UFM000	
											MANAGER ZW	DATE 12/1/16		DRAWING 9100
											FILE: 2016/UFM000-9100.0	SCALE: NONE	SHEET 9 OF 18	REV 4



NOTES:
 1. FILTERED WATER CONNECTION AND FILTRATE LINE SIZES TO FORWARDING PUMP WILL BE SET PER JOB.

REV	DESCRIPTION	DATE	DWN	CHKD	APVD	ECN
-	SEE SHEET ONE					

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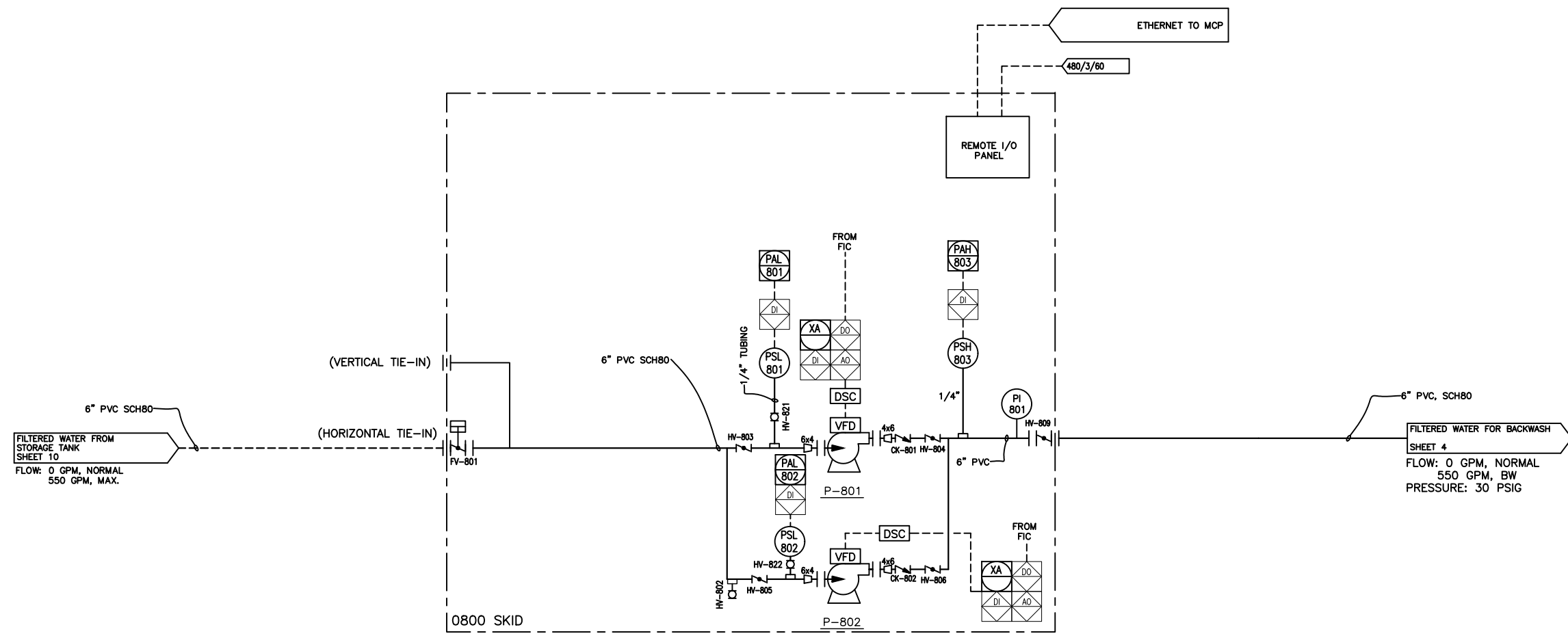
DESIGNER	DATE	TITLE
DRA	12/1/16	PROCESS AND INSTRUMENTATION DIAGRAM
CHECKER	DATE	FILTRATED WATER STORAGE TANK
JMP	12/1/16	UF TRAILER - MEMCOR UF
ENGINEER	DATE	CLIENT
DRA	12/1/16	EVOQUA
MANAGER	DATE	ROCKFORD, IL
ZW	12/1/16	
FILE:		
20324/UFM000-9100-0		
SCALE:	NONE	

		WATER TECHNOLOGIES COLORADO SPRINGS, CO 719-570-9600	
PROJECT	CODE	DRAWING	SHEET
UFM000		9100	10 OF 18
REV			4

STD: BORDER-0106-24X36D1

INTL REF: _____

BAR = 1" AT PLOT SCALE



P-801, P-802
 (2 PUMPS)
 UF FILTRATE BACKWASH PUMP
 MFG: GRUNDFOS CRNE150-1-1
 DESIGN: 550 GPM @ 30 PSI
 DRIVER: 25 HP / 3600 RPM
 (460V/3Ph/60 Hz / 40C MAX. OPERATING TEMP)(VFD)
 ENVIRONMENTAL CONDITIONS/LIMITATIONS TO BE TAKEN INTO ACCOUNT AT SITE
 SP GR: 1.0
 MATL: 316SS

- NOTES:**
1. FLOWMETERS HAVE INTEGRAL NEEDLE VALVE.
 2. 2" PVC SCH80 PIPE DRAIN TO SUMP TANK.

STD: BORDER-0106-24X36D1

INTL REF:

BAR = 1" AT PLOT SCALE

REV DESCRIPTION DATE DWN CHKD APVD ECN

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CHECKER	DATE
JMP	12/1/16
ENGINEER	DATE
DRA	12/1/16
MANAGER	DATE
ZW	12/1/16
FILE:	20324/UFM000-9100-0
SCALE:	NONE

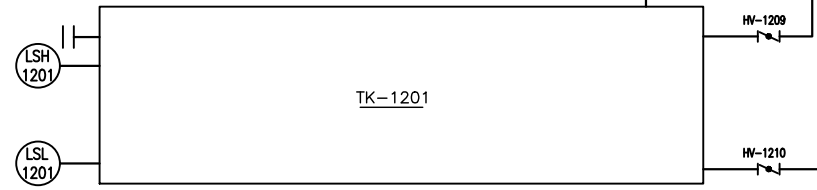
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CLIENT		EVOQUA ROCKFORD, IL	
PROJECT		CODE	DRAWING
UFM000		9100	11 OF 18
SHEET		REV	
11 OF 18		4	



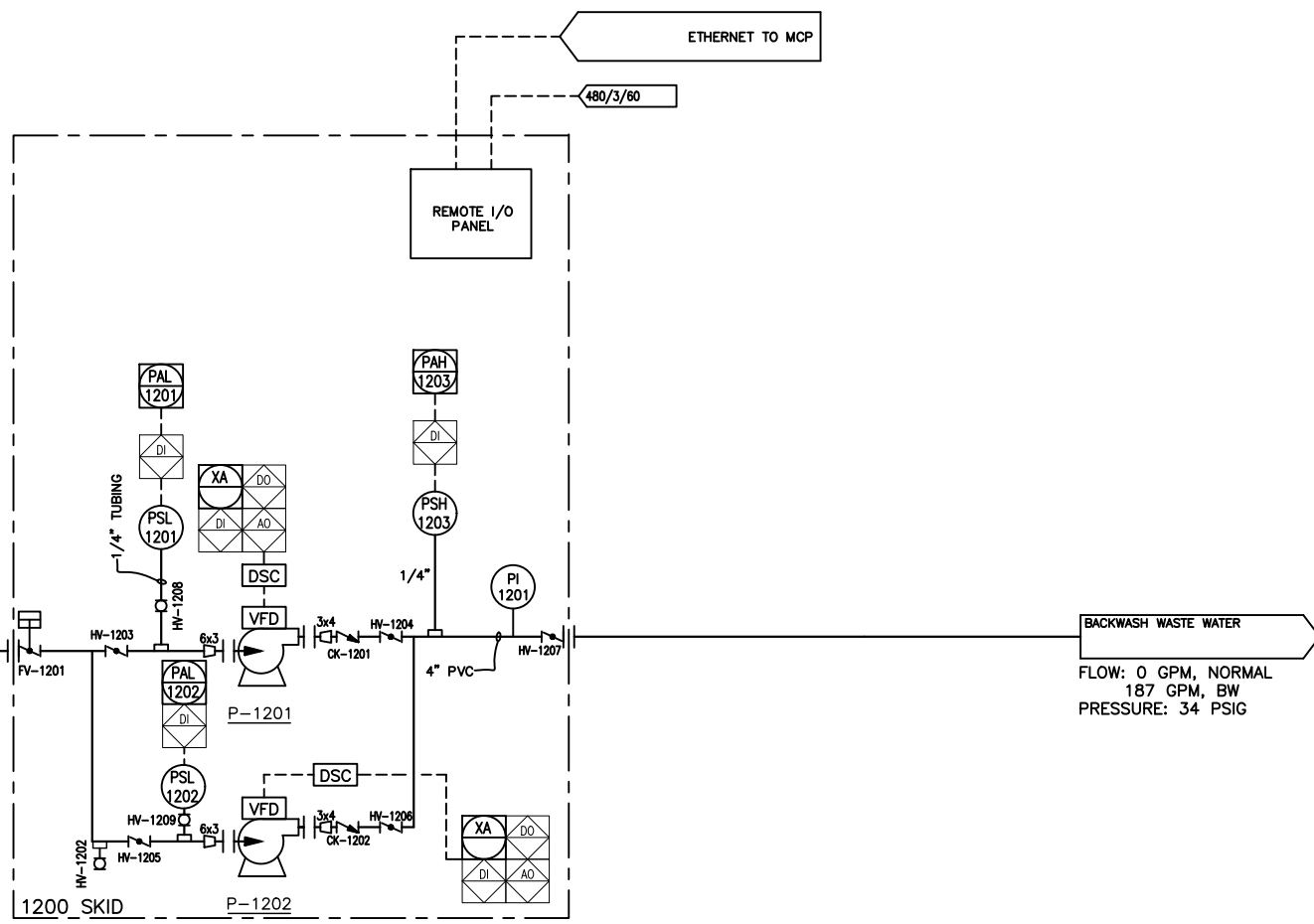
WATER TECHNOLOGIES
 COLORADO SPRINGS, CO
 719-570-9600

BW WASTE TO BACKWASH WASTE TANK SHEET 4
 FLOW: 0 GPM, TYP.
 550 GPM MAX
 PRESSURE: 10 PSIG, MAX

AIR SCOUR BLEED WATER TO BACKWASH WASTE TANK SHEET 4
 HOSE TO BE FIELD PIPED



TK-1201
 BACKWASH WASTE COLLECTION TANK
 SIZE: 128"L X 84"W X 42"H
 TOTAL CAP: 1,600 GAL
 SP GR: 1.05
 MATL: PE



ETHERNET TO MCP
 480/3/60

BACKWASH WASTE WATER
 FLOW: 0 GPM, NORMAL
 187 GPM, BW
 PRESSURE: 34 PSIG

P-1201, P-1202
 (2 PUMPS)
 UF BACKWASH TRANSFER PUMPS
 MFG: GRUNDFOS CRNE45-1-1
 DESIGN: 187 GPM @ 34 PSI
 DRIVER: 7.5 HP / 3600 RPM
 (460V/3Ph/60 Hz / 40C MAX. OPERATING TEMP)(VFD)
 ENVIRONMENTAL CONDITIONS/LIMITATIONS TO BE TAKEN INTO ACCOUNT AT SITE
 SP GR: 1.0
 MATL: 316SS

- NOTES:
 1. FLOWMETERS HAVE INTEGRAL NEEDLE VALVE.
 2. 2" PVC SCH80 PIPE DRAIN TO SUMP TANK.

STD: BORDER-0106-24X36D1

INTL REF:

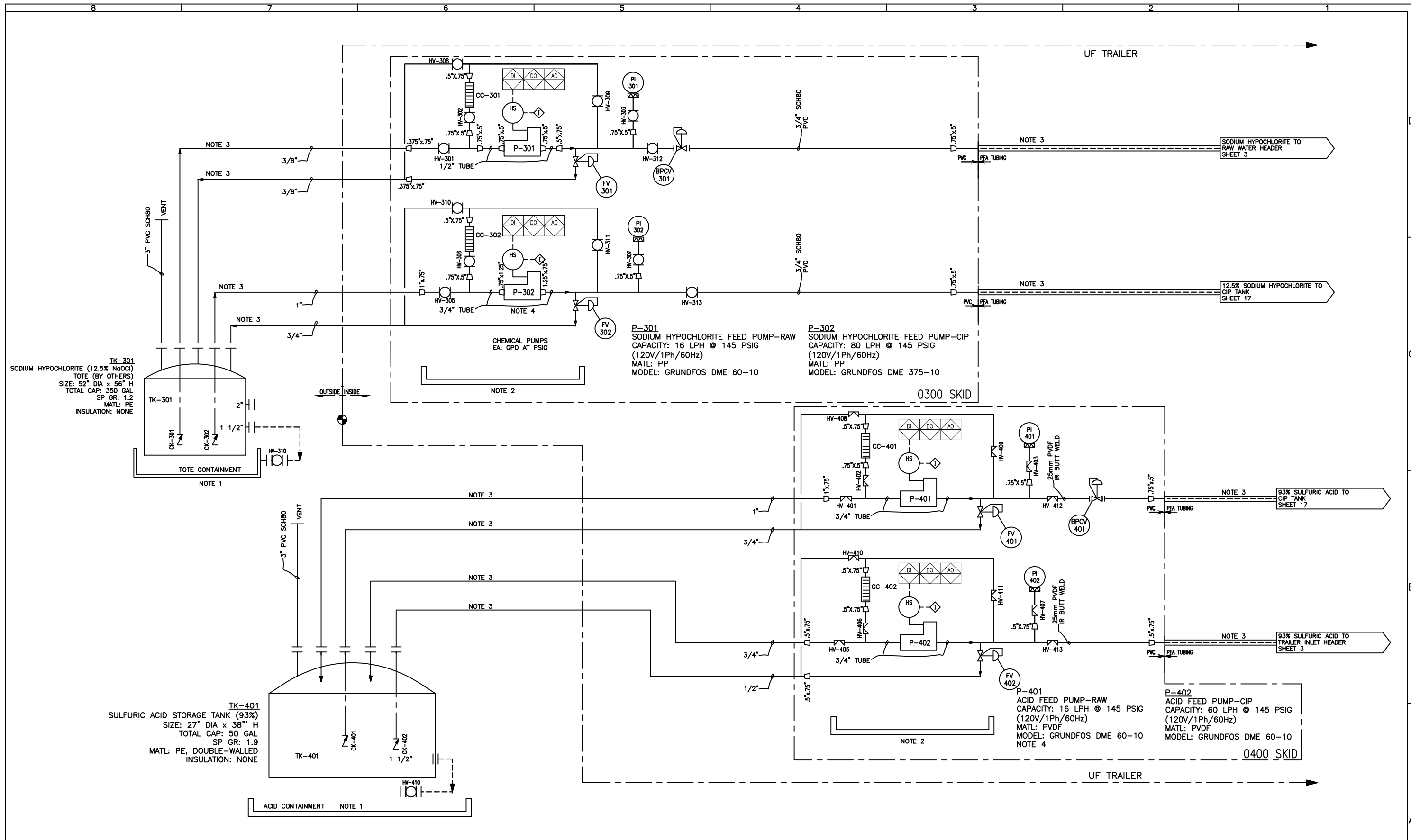
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REV DESCRIPTION DATE DWN CHKD APVD ECN

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DESIGNER DATE
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 CHECKER DATE
 JMP 12/1/16
 ENGINEER DATE
 DRA 12/1/16
 MANAGER DATE
 ZW 12/1/16
 FILE: 2034/UFM000-9100_0
 SCALE: NONE

TITLE	PROCESS AND INSTRUMENTATION DIAGRAM UF BACKWASH PUMP UF TRAILER - MEMCOR UF
CLIENT	EVOQUA ROCKFORD, IL
PROJECT	UFM000
CODE	
DRAWING	9100
SHEET	12 OF 18
REV	4



TK-301
SODIUM HYPOCHLORITE (12.5% NaOCl)
TOTE (BY OTHERS)
SIZE: 52" DIA x 56" H
TOTAL CAP: 350 GAL
SP GR: 1.2
MATL: PE
INSULATION: NONE

TK-401
SULFURIC ACID STORAGE TANK (93%)
SIZE: 27" DIA x 38" H
TOTAL CAP: 50 GAL
SP GR: 1.9
MATL: PE, DOUBLE-WALLED
INSULATION: NONE

P-301
SODIUM HYPOCHLORITE FEED PUMP-RAW
CAPACITY: 16 LPH @ 145 PSIG
(120V/1Ph/60Hz)
MATL: PP
MODEL: GRUNDFOS DME 60-10

P-302
SODIUM HYPOCHLORITE FEED PUMP-CIP
CAPACITY: 80 LPH @ 145 PSIG
(120V/1Ph/60Hz)
MATL: PP
MODEL: GRUNDFOS DME 375-10

P-401
ACID FEED PUMP-RAW
CAPACITY: 16 LPH @ 145 PSIG
(120V/1Ph/60Hz)
MATL: PVDF
MODEL: GRUNDFOS DME 60-10

P-402
ACID FEED PUMP-CIP
CAPACITY: 60 LPH @ 145 PSIG
(120V/1Ph/60Hz)
MATL: PVDF
MODEL: GRUNDFOS DME 60-10

- NOTES:
1. TANK CONTAINMENTS SPECIFIC TO JOB.
 2. METERING PUMP CONTAINMENT - PE RECTANGULAR BASINS PROVIDED TO PROTECT FLOORING.
 3. OFF PUMP SKID TUBING SUPPLIED/INSTALLED BY JOB.
 4. ACID CIP DOSING PUMP CONTROLLED BY CIP RECIRCULATION pH TRANSMITTER AIT-101.

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FILE: 2016/UFM000-9100-0
SCALE: NONE

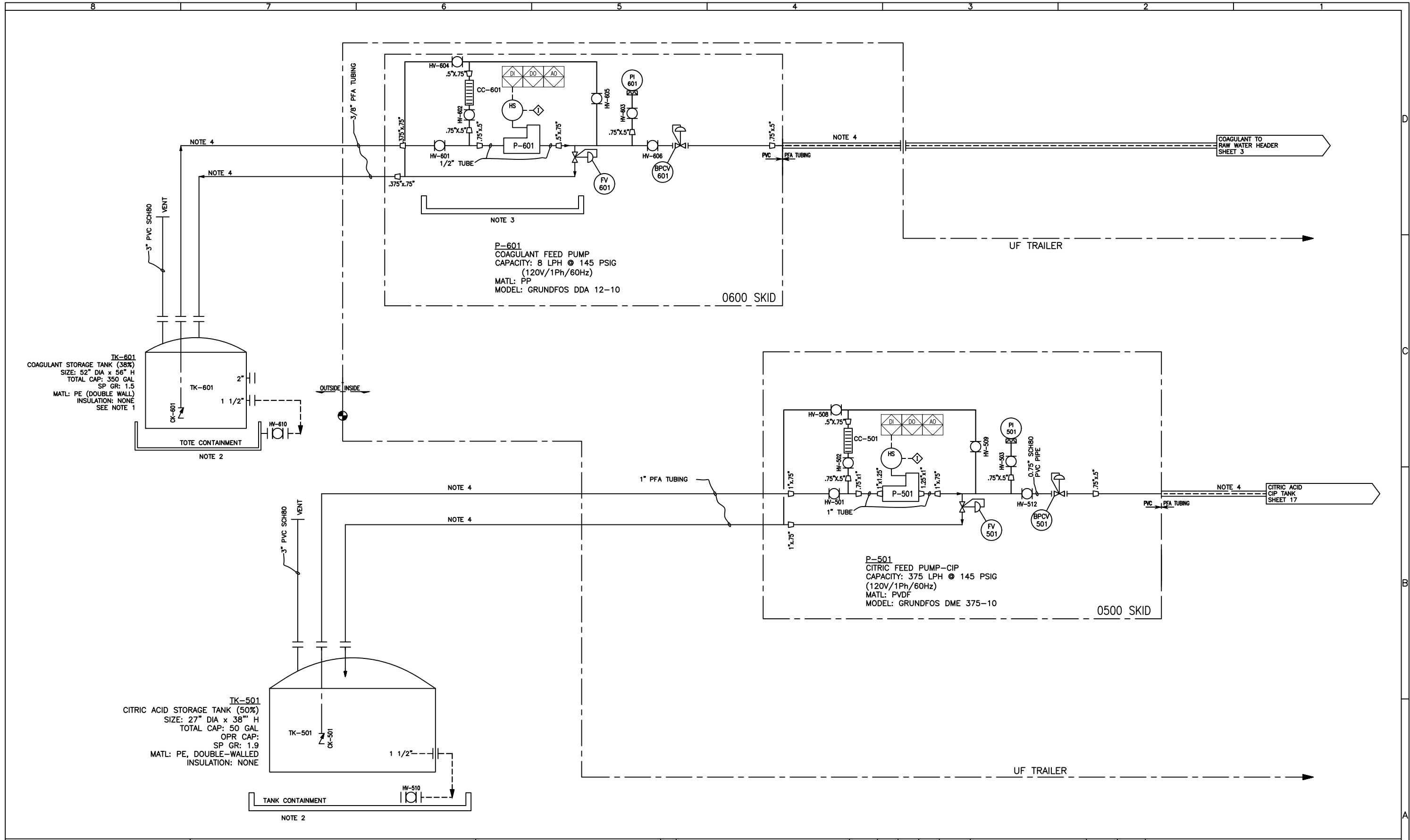
TITLE		PROCESS AND INSTRUMENTATION DIAGRAM SODIUM HYPOCHLORITE AND SULFURIC ACID UF TRAILER - MEMCOR UF			
CLIENT		EVOQUA ROCKFORD, IL			
PROJECT		UFM000	CODE	DRAWING	9100
SHEET		13 OF 18		REV	4

STD: BORDER-0106-24X36D1

INTL REF:

BAR = 1" AT PLOT SCALE

REV	DESCRIPTION	DATE	DWN	CHKD	APVD	ECH
-	SEE SHEET ONE					



TK-601
 COAGULANT STORAGE TANK (38%)
 SIZE: 52" DIA x 56" H
 TOTAL CAP: 350 GAL
 SP GR: 1.5
 MATL: PE (DOUBLE WALL)
 INSULATION: NONE
 SEE NOTE 1

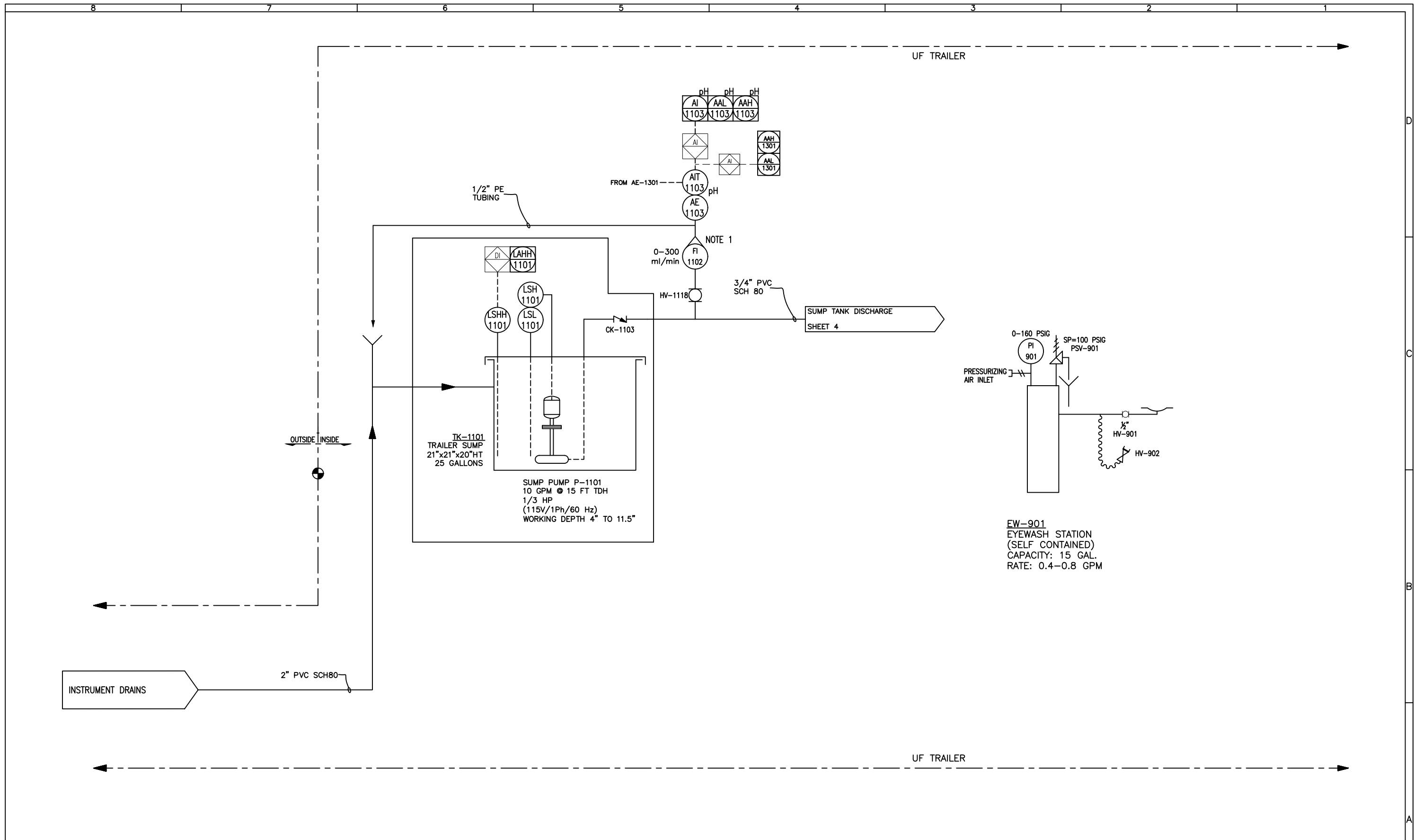
TK-501
 CITRIC ACID STORAGE TANK (50%)
 SIZE: 27" DIA x 38" H
 TOTAL CAP: 50 GAL
 OPR CAP: 50 GAL
 SP GR: 1.9
 MATL: PE, DOUBLE-WALLED
 INSULATION: NONE

P-601
 COAGULANT FEED PUMP
 CAPACITY: 8 LPH @ 145 PSIG
 (120V/1Ph/60Hz)
 MATL: PP
 MODEL: GRUNDFOS DDA 12-10

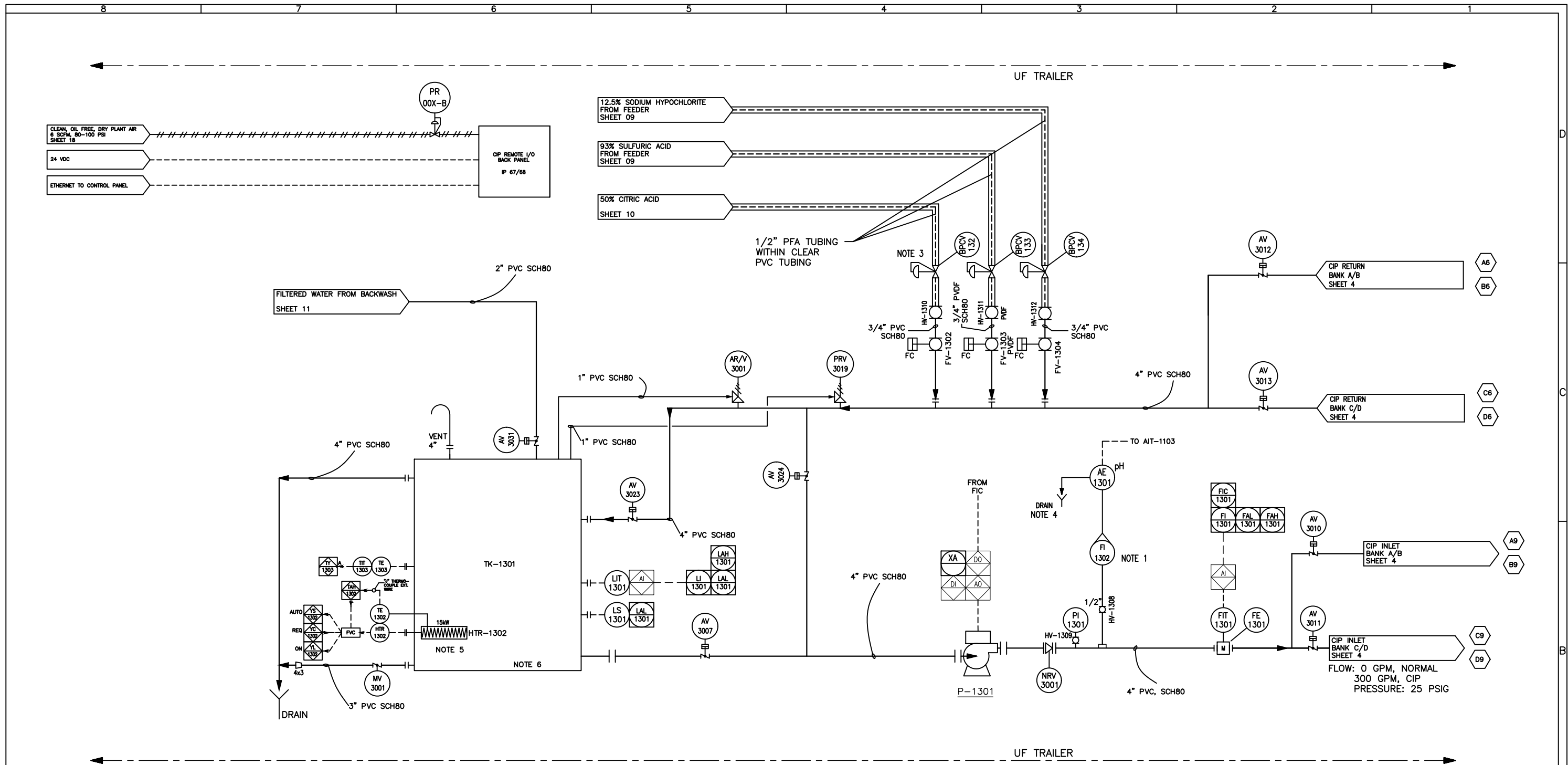
P-501
 CITRIC FEED PUMP-CIP
 CAPACITY: 375 LPH @ 145 PSIG
 (120V/1Ph/60Hz)
 MATL: PVDF
 MODEL: GRUNDFOS DME 375-10

NOTE 1: COAGULANT TO BE IRON OR ALUMINUM BASED, NO ORGANIC BASED PRODUCT.
NOTE 2: TANK CONTAINMENTS SPECIFIC TO JOB.
NOTE 3: METERING PUMP CONTAINMENT - PE RECTANGULAR BASINS PROVIDED TO PROTECT FLOORING.
NOTE 4: OFF PUMP SKID TUBING SUPPLIED/INSTALLED BY JOB.

COMPANY CONFIDENTIAL		DESIGNER	DATE	TITLE
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		CHECKER	DATE	CLIENT
		JMP	12/1/16	EVOQUA ROCKFORD, IL
		ENGINEER	DATE	
		DRA	12/1/16	
		MANAGER	DATE	
		ZW	12/1/16	
		FILE		
		SCALE	1" = 10'	
		PROJECT	CODE	DRAWING
		UFM000		9100
		SHEET	REV	
		14 OF 18	4	



NOTES: 1. TRAILER CONNECTION BOX, FRONT CURB SIDE LOCATION.	INTL REF:	BAR = 1" AT PLOT SCALE	REV	DESCRIPTION	DATE	DWN	CHKD	APVD	ECN	COMPANY CONFIDENTIAL THIS DOCUMENT AND ALL INFORMATION CONTAINED HEREIN ARE THE PROPERTY OF EVOQUA AND/OR ITS AFFILIATES. THE DESIGN CONCEPTS AND INFORMATION CONTAINED HEREIN ARE PROPRIETARY TO EVOQUA AND ARE SUBMITTED IN CONFIDENCE. THEY ARE NOT TRANSFERABLE AND MUST BE USED ONLY FOR THE PURPOSE FOR WHICH THE DOCUMENT IS EXPRESSED. REPRODUCTION, LOANED OR USED IN ANY OTHER MANNER WITHOUT THE EXPRESS WRITTEN CONSENT OF EVOQUA. IN NO EVENT SHALL THEY BE USED IN ANY MANNER DETRIMENTAL TO THE INTEREST OF EVOQUA. ALL PATENT RIGHTS ARE RESERVED. UPON THE DEMAND OF EVOQUA, THIS DOCUMENT, ALONG WITH ALL COPIES AND EXTRACTS, AND ALL RELATED NOTES AND ANALYSES, MUST BE RETURNED TO EVOQUA OR DESTROYED AS INSTRUCTED BY EVOQUA. ACCEPTANCE OF THE DELIVERY OF THIS DOCUMENT CONSTITUTES AGREEMENT TO THESE TERMS.	DESIGNER DRA	DATE 12/1/16	TITLE PROCESS AND INSTRUMENTATION DIAGRAM UTILITIES UF TRAILER - MEMCOR UF		
											CHECKER JMP	DATE 12/1/16	CLIENT EVOQUA ROCKFORD, IL		
STD: BORDER-0106-24X36D1										MANAGER ZW	DATE 12/1/16	PROJECT UFM000	CODE 9100	DRAWING 15 OF 18	REV 4



CIP TANK
 TK-1301
 SIZE: 32"x36"x96" HIGH
 MATERIAL: FIBERGLASS
 CAPACITY: 400 GALLONS

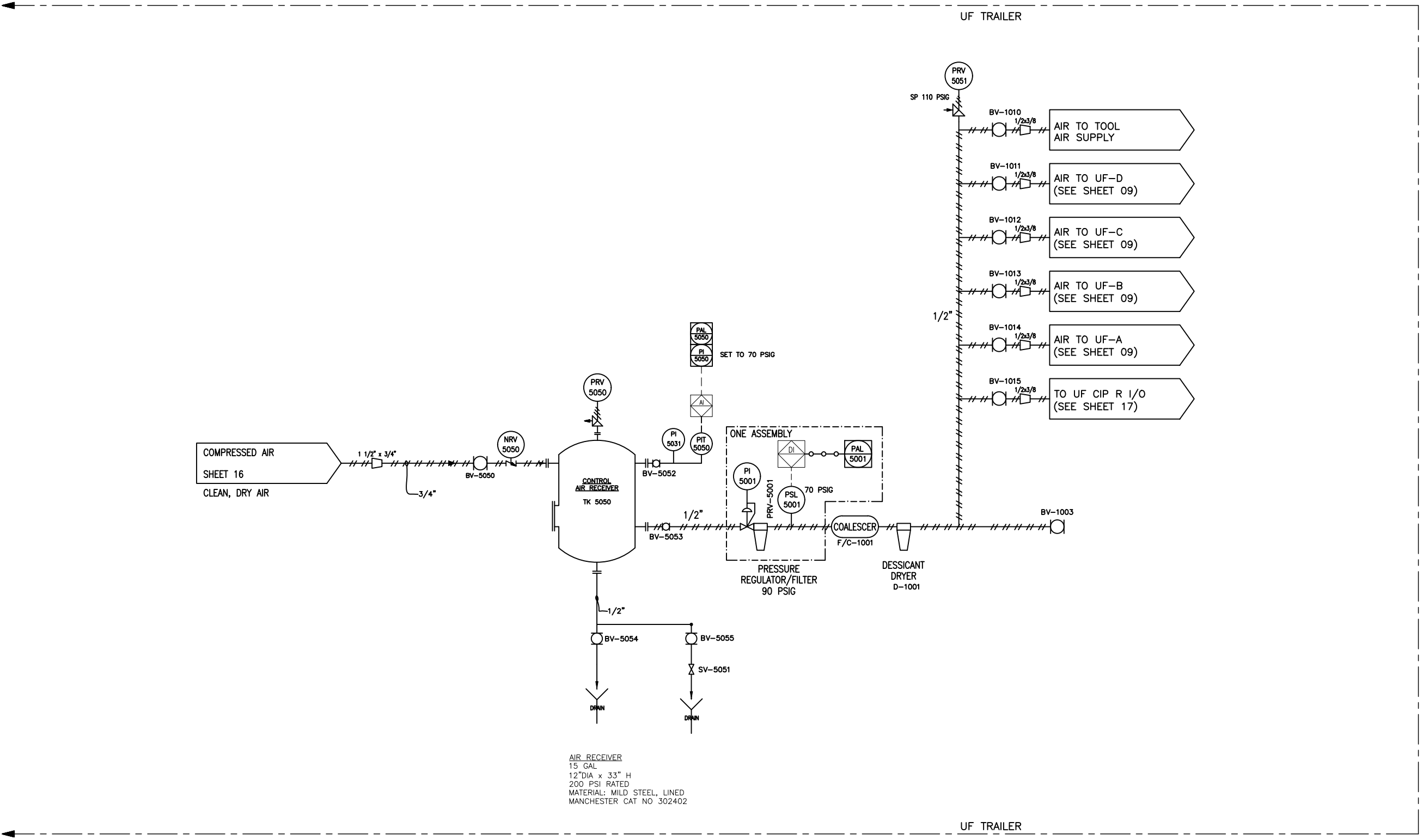
CIP TANK HEATER
 HTR-1302
 480V/3PH/60Hz
 15 kW
 WATLOW FNR725A5XS-1

P-1301
 UF CIP PUMP
 MFG: GRUNDFOS CRNE150-1-1
 DESIGN: 300 GPM @ 25 PSI
 DRIVER: 25 HP / 3600 RPM
 (460V/3Ph/60 Hz / 40C MAX. OPERATING TEMP)(VFD)
 ENVIRONMENTAL CONDITIONS/LIMITATIONS TO BE TAKEN INTO ACCOUNT AT SITE
 SP GR: 1.0
 MATL: 316SS

- NOTES:**
1. FLOWMETERS HAVE INTEGRAL NEEDLE VALVE.
 2. TRAILER CONNECTION BOX, FRONT CURB SIDE LOCATION.
 3. BPCV TO BE LOOSE SHIPPED.
 4. 2" PVC SCH80 PIPE DRAIN TO SUMP TANK.
 5. HEATER ELEMENT.
 6. TANK FLOOR TO SLOPE TOWARDS DRAIN AND OUTLET CONNECTIONS.

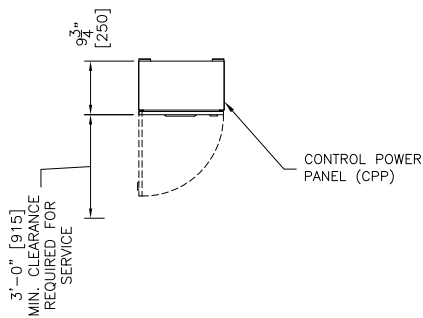
STD: BORDER-0106-24X36D1	INTL REF:	BAR = 1" AT PLOT SCALE	REV	DESCRIPTION	DATE	DWN	CHKD	APVD	ECH	COMPANY CONFIDENTIAL THIS DOCUMENT AND ALL INFORMATION CONTAINED HEREIN ARE THE PROPERTY OF EVOQUA AND/OR ITS AFFILIATES. THE DESIGN CONCEPTS AND INFORMATION CONTAINED HEREIN ARE PROPRIETARY TO EVOQUA AND ARE SUBMITTED IN CONFIDENCE. THEY ARE NOT TO BE REPRODUCED, COPIED, OR USED IN ANY MANNER WITHOUT THE EXPRESS WRITTEN CONSENT OF EVOQUA. IN NO EVENT SHALL THEY BE USED IN ANY MANNER DETRIMENTAL TO THE INTEREST OF EVOQUA. ALL PATENT RIGHTS ARE RESERVED. UPON THE DEMAND OF EVOQUA, THIS DOCUMENT, ALONG WITH ALL COPIES AND EXTRACTS, AND ALL RELATED NOTES AND ANALYSES, MUST BE RETURNED TO EVOQUA OR DESTROYED AS INSTRUCTED BY EVOQUA. ACCEPTANCE OF THE DELIVERY OF THIS DOCUMENT CONSTITUTES AGREEMENT TO THESE TERMS.	DESIGNER DRA 12/1/16	DATE 12/1/16	TITLE PROCESS AND INSTRUMENTATION DIAGRAM CIP SYSTEM UF TRAILER - MEMCOR UF	
				- SEE SHEET ONE						CHECKER JMP 12/1/16	DATE 12/1/16	CLIENT EVOQUA ROCKFORD, IL		
										ENGINEER DRA 12/1/16	DATE 12/1/16	WATER TECHNOLOGIES COLORADO SPRINGS, CO 719-570-9600		
										MANAGER ZW 12/1/16	DATE 12/1/16		PROJECT UFM000	
										FILE: 2016/UFM000-9100.0	SCALE: NONE	DRAWING 9100	SHEET 17 OF 18	REV 4

8 7 6 5 4 3 2 1

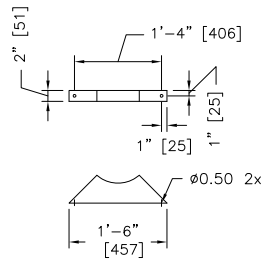


AIR RECEIVER
15 GAL
12" DIA x 33" H
200 PSI RATED
MATERIAL: MILD STEEL, LINED
MANCHESTER CAT NO 302402

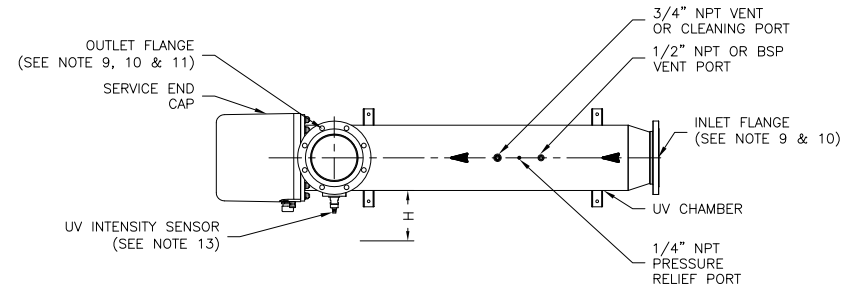
STD: BORDER-0106-24X36D1	INTL REF:	BAR = 1" AT PLOT SCALE	REV	DESCRIPTION	DATE	DWN	CHKD	APVD	ECN	<p>COMPANY CONFIDENTIAL</p> <p>THIS DOCUMENT AND ALL INFORMATION CONTAINED HEREIN ARE THE PROPERTY OF EVOQUA AND/OR ITS AFFILIATES. THE DESIGN CONCEPTS AND INFORMATION CONTAINED HEREIN ARE PROPRIETARY TO EVOQUA AND ARE SUBMITTED IN CONFIDENCE. THEY ARE NOT TRANSFERABLE AND MUST BE USED ONLY FOR THE PURPOSE FOR WHICH THE DOCUMENT IS EXPRESSED. LOANED, REPRODUCED, LOANED OR USED IN ANY OTHER MANNER WITHOUT THE EXPRESS WRITTEN CONSENT OF EVOQUA. IN NO EVENT SHALL THEY BE USED IN ANY MANNER DETRIMENTAL TO THE INTEREST OF EVOQUA. ALL PATENT RIGHTS ARE RESERVED. UPON THE DEMAND OF EVOQUA, THIS DOCUMENT, ALONG WITH ALL COPIES AND EXTRACTS, AND ALL RELATED NOTES AND ANALYSES, MUST BE RETURNED TO EVOQUA OR DESTROYED AS INSTRUCTED BY EVOQUA. ACCEPTANCE OF THE DELIVERY OF THIS DOCUMENT CONSTITUTES AGREEMENT TO THESE TERMS.</p>	DESIGNER DRA	DATE 12/1/16	TITLE PROCESS AND INSTRUMENTATION DIAGRAM PROCESS AIR UF TRAILER - MEMCOR UF				
											CHECKER JMP	DATE 12/1/16	CLIENT EVOQUA ROCKFORD, IL				
											ENGINEER DRA	DATE 12/1/16	MANAGER ZW	DATE 12/1/16	<p>WATER TECHNOLOGIES COLORADO SPRINGS, CO 719-570-9600</p>		
											FILE: 2016/UFM000-9100_0	SCALE: NONE	PROJECT UFM000	CODE	DRAWING 9100	SHEET 18 OF 18	REV 4



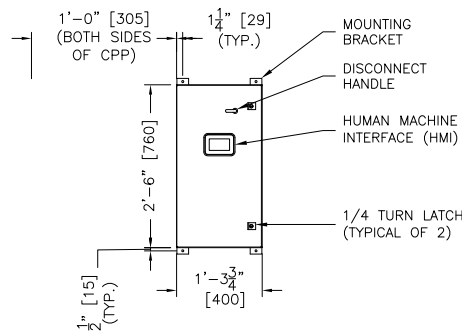
TOP VIEW OF CPP
SCALE: NOT TO SCALE



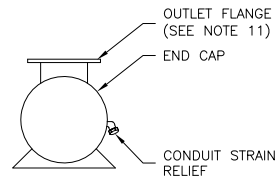
BRACKET DETAIL
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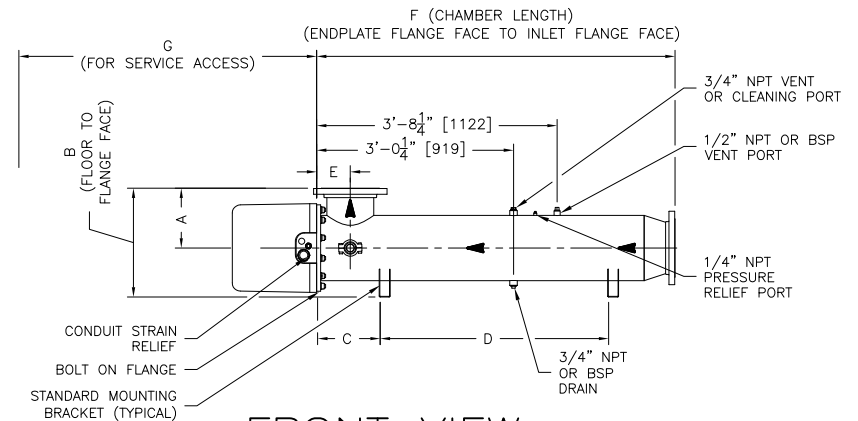
TOP VIEW
SCALE: NOT TO SCALE



FRONT VIEW OF CPP
SCALE: NOT TO SCALE



END VIEW
SCALE: NOT TO SCALE



FRONT VIEW
SCALE: NOT TO SCALE

NOTES:

- [] INDICATES MILLIMETERS UNLESS OTHERWISE SPECIFIED.
- CONNECTION SEALS AND HARDWARE TO BE SUPPLIED BY CUSTOMER.
- INTERCONNECTING CABLE LENGTH TO BE 15ft [4.5m].
- MAXIMUM OPERATING PRESSURE TO BE 150 psi [10 BAR].
- MOUNTING AND SAMPLING PORTS ARE TO BE SUPPLIED BY THE CUSTOMER.
- CLEARANCES FOR WIPING SYSTEMS FALL WITHIN CLEARANCES REQUIRED FOR SLEEVE REMOVAL.
- LAMP TYPES AVAILABLE: A - DISINFECTION
V - VALIDATED DISINFECTION
AMWS - AUTOMATIC MECHANICAL WIPING SYSTEM OPTIONAL
- ANSI FLANGE: ASME/ANSI B16.5 SLIP-ON WELDING CLASS 150
DN FLANGE: EN 1092-1, TYPE 1, PN 10. (STANDARD)
- ANSI FLANGE: ASME/ANSI B16.5 SLIP-ON WELDING CLASS 300
DN FLANGE: EN 1092-1, TYPE 1, PN 16. (OPTIONAL)
- OUTLET LOCATION OPTION: 12,3,6,9 O'CLOCK (VIEWED FROM SERVICE END).
- WHEN OUTLET LOCATION IS NOT 12 O'CLOCK AIR VENT IS PROVIDED
- UV INTENSITY SENSOR LOCATION MOVES TO THE OPPOSITE SIDE OF THE UV CHAMBER WHEN THE OUTLET IS ROTATED 90° CW FROM THE END VIEW SHOWN.

MODEL	LAMP LENGTH	UV CHAMBER ASSEMBLY DIAMETER	# LAMPS AVAILABLE	FLANGE TYPE	FLANGE SIZE	DIM. 'A'	DIM. 'B'	DIM. 'C'	DIM. 'D'	DIM. 'E'	DIM. 'F'	DIM. 'G'	DIM. 'H'	OPTIONAL WIPING SYSTEM	PANEL RATING	PANEL MATERIAL
D06	LONG	12" [300]	6	ANSI/ DN	8" [200]	11" [279]	1'-8" [508]	11 1/2" [292]	3'-6" [1067]	6 1/2" [157]	5'-6" [1673]	5'-10" [1778]	9" [229]	AMWS	TYPE 12 (IP54) TYPE 3R (IP55) TYPE 4X (IP66)	MILD PAINTED STEEL MILD PAINTED STEEL 304 SST

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DESCRIPTION: STD, TROJANUVSWIFTSC D06 MODEL		STD. DRAWING NO. SW0053	
DRAWN BY : MVW/SAH	DATE : 14NO27	REFERENCE NO. N/A	
CHECKED BY : SZ	DATE : 14NO27	DWG NO.	REV.
APPROVED BY : MVW	DATE : 14NO27	D01	L
SCALE (8.5x11) : NOT TO SCALE		LOG NUMBER : N/A	