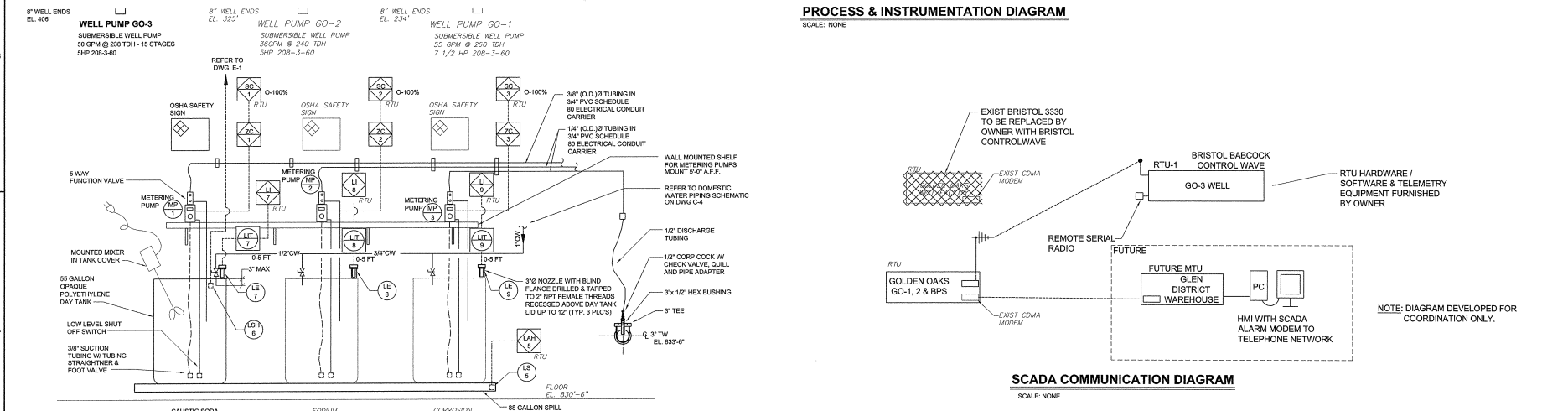
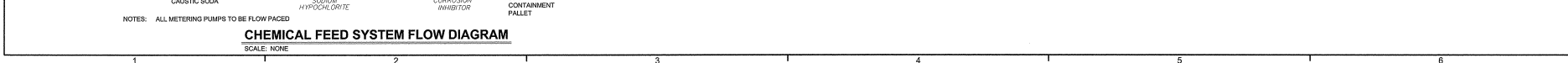


PROCESS & INSTRUMENTATION DIAGRAM
SCALE: NONE



SCADA COMMUNICATION DIAGRAM
SCALE: NONE



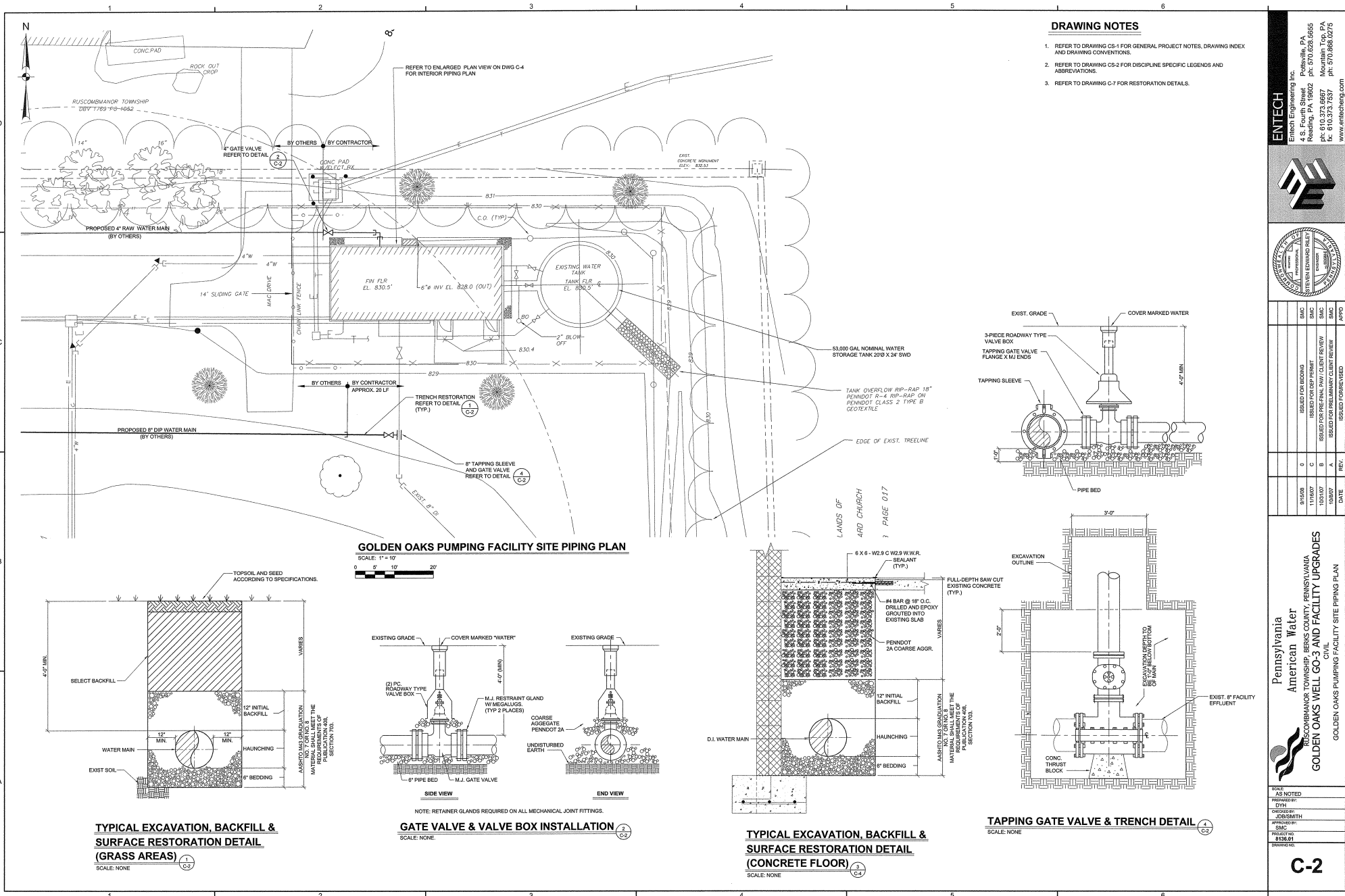
CHEMICAL FEED SYSTEM FLOW DIAGRAM
SCALE: NONE

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Pennsylvania American Water
RICHBOROUGH TOWNSHIP, BERKS COUNTY, PENNSYLVANIA
GOLDEN OAKS WELL GO-3 AND FACILITY UPGRADES
CIVIL / MECH
PROCESS & INSTRUMENTATION, CHEMICAL FLOW & SCADA DIAGRAMS

NO.	DATE	REV.	ISSUED FOR/REVISION
0	01/20/08		ISSUED FOR BIDDING
1	01/16/07		ISSUED FOR PRELIMINARY CLIENT REVIEW
2	03/07/07		ISSUED FOR PRELIMINARY CLIENT REVIEW
3	03/07/07		ISSUED FOR PRELIMINARY CLIENT REVIEW
4	03/07/07		ISSUED FOR PRELIMINARY CLIENT REVIEW
5	03/07/07		ISSUED FOR PRELIMINARY CLIENT REVIEW

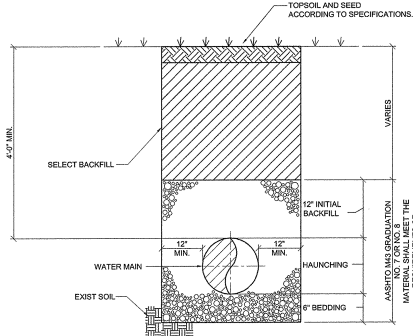
SCALE: AS NOTED
 PREPARED BY: DYH
 CHECKED BY: JOSH SMITH
 APPROVED BY: SMC
 PROJECT NO.: 81584
 DRAWING NO.: C-1



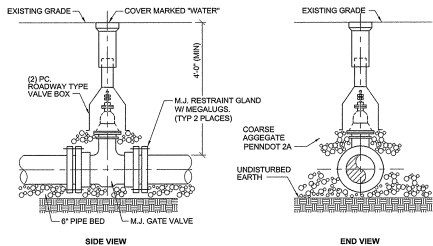
GOLDEN OAKS PUMPING FACILITY SITE PIPING PLAN

SCALE: 1" = 10'

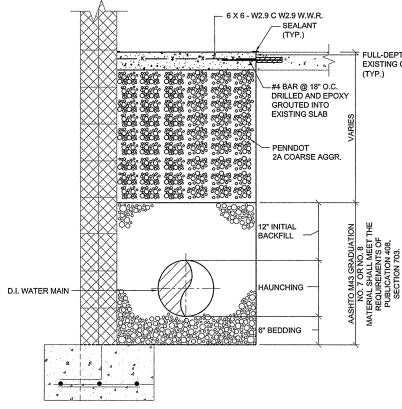
TYPICAL EXCAVATION, BACKFILL & SURFACE RESTORATION DETAIL (GRASS AREAS)
SCALE: NONE



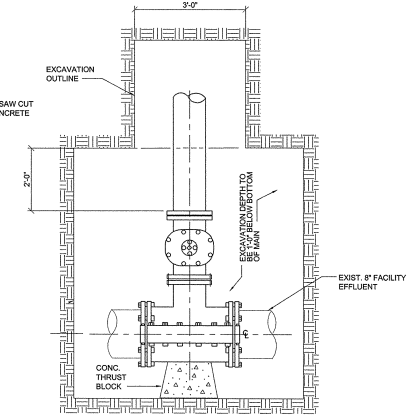
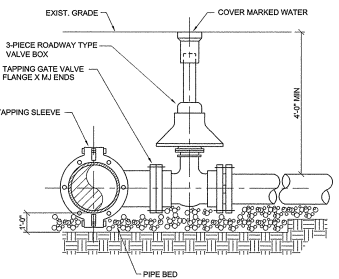
GATE VALVE & VALVE BOX INSTALLATION
SCALE: NONE



TYPICAL EXCAVATION, BACKFILL & SURFACE RESTORATION DETAIL (CONCRETE FLOOR)
SCALE: NONE



TAPPING GATE VALVE & TRENCH DETAIL
SCALE: NONE



DRAWING NOTES

1. REFER TO DRAWING CS-1 FOR GENERAL PROJECT NOTES, DRAWING INDEX AND DRAWING CONVENTIONS.
2. REFER TO DRAWING CS-2 FOR DISCIPLINE SPECIFIC LEGENDS AND ABBREVIATIONS.
3. REFER TO DRAWING C-7 FOR RESTORATION DETAILS.

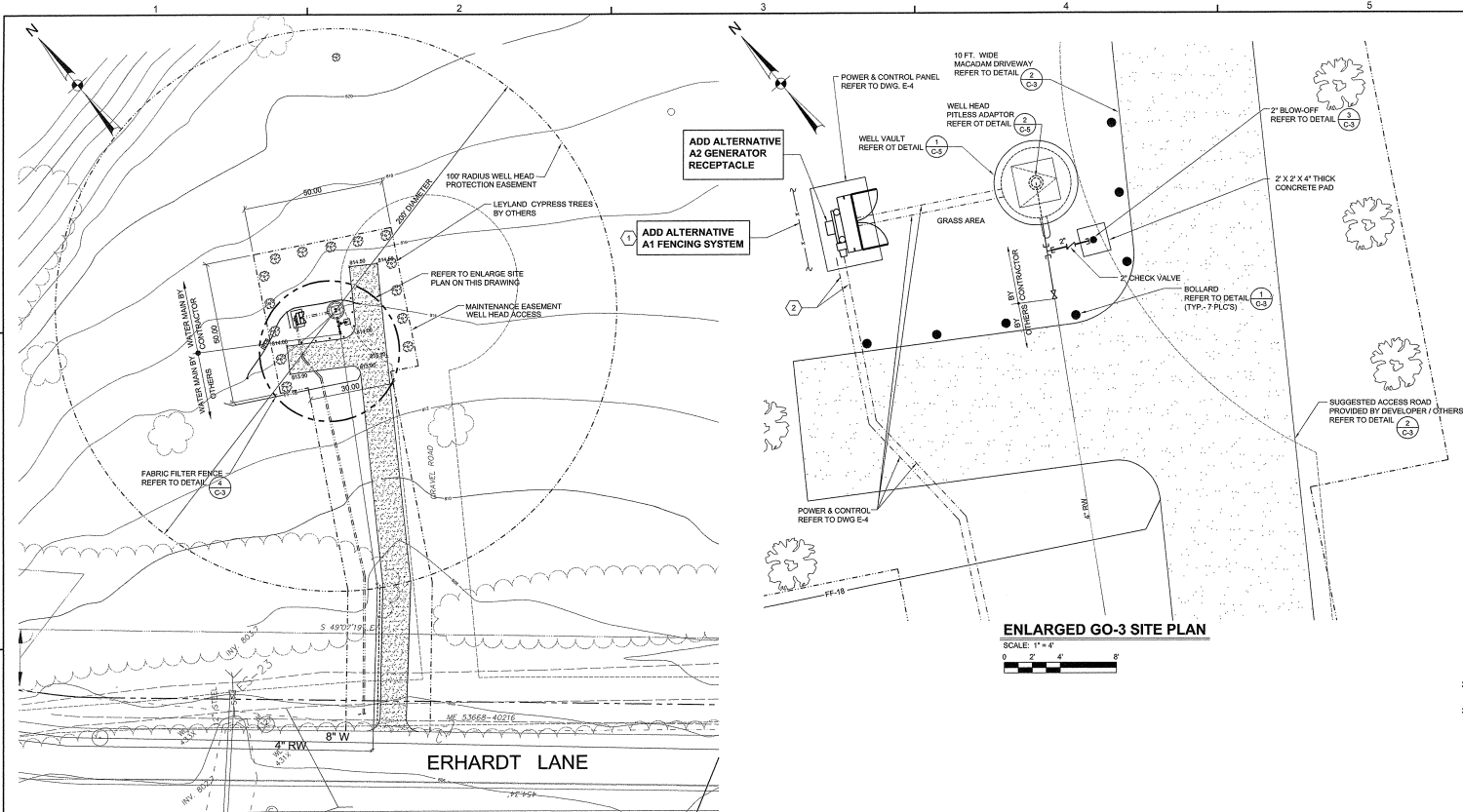
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NO.	DATE	REV.	ISSUED FOR	APP'D.
0	01/15/08		ISSUED FOR BIDDING	SMC
1	11/16/07	C	ISSUED FOR PRELIMINARY CLIENT REVIEW	SMC
2	10/10/07	B	ISSUED FOR PRELIMINARY CLIENT REVIEW	SMC
3	10/10/07	A	ISSUED FOR PRELIMINARY CLIENT REVIEW	SMC
			ISSUED FOR PRELIMINARY CLIENT REVIEW	SMC

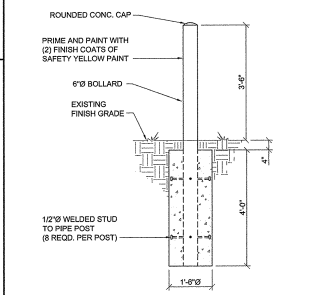
Pennsylvania
American Water
ESCOMBACH TOWNSHIP, BERKS COUNTY, PENNSYLVANIA
GOLDEN OAKS WELL GO-3 AND FACILITY UPGRADES
GOLDEN OAKS PUMPING FACILITY SITE PIPING PLAN

NO.	DATE	REV.	ISSUED FOR	APP'D.
1			AS NOTED	
2			PREPARED BY: DYE	
3			CHECKED BY: JOHNSMITH	
4			APPROVED BY: SMC	
5			PROJECT NO: 0126.01	
6			DRAWING:	

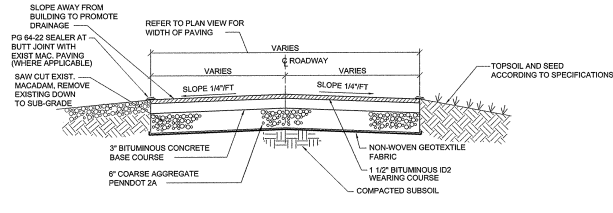


GO-3 SITE PLAN
SCALE: 1" = 20'
0 10 20 40'

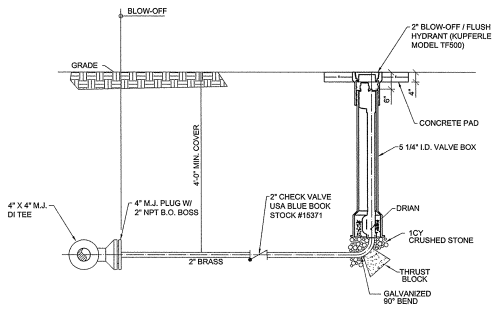
ENLARGED GO-3 SITE PLAN
SCALE: 1" = 4'
0 2' 4' 8'



EXTERIOR BOLLARD DETAIL
SCALE: NONE



BITUMINOUS ACCESS ROAD AND PARKING AREA DETAIL
SCALE: NONE



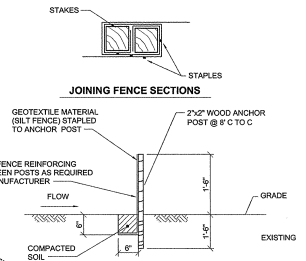
2" BLOW-OFF ASSEMBLY
SCALE: NONE

DRAWING NOTES

- REFER TO DRAWING CS-1 FOR GENERAL PROJECT NOTES, DRAWING INDEX AND DRAWING CONVENTIONS.
- REFER TO DRAWING CS-2 FOR DISCIPLINE SPECIFIC LEGENDS AND ABBREVIATIONS.

KEYED DRAWING NOTES

- PROVIDE ADD ALTERNATE UNIT PRICE FOR 8' HIGH P.V.C. COATED GALVANIZED FENCE SYSTEM CONSISTING OF XXX L.F FENCE SYSTEM, 1 XX WIDE ROLLING GATE, 1 XX WIDE MAN GATE.
- DEVELOPER TO PROVIDE CONDUITS AND SERVICE WIRING TO POWER AND CONTROL PANEL PAD LOCATION. REFER TO DWG. E-4 FOR DETAILS.



- NOTES:**
- FILTER FABRIC FENCE MUST BE INSTALLED AT LEVEL GRADE. BOTH ENDS OF EACH FENCE SECTION MUST BE EXTENDED AT LEAST 6' UP SLOPE AT 45 DEGREES TO THE MAIN FENCE ALIGNMENT.
 - SEDIMENT MUST BE REMOVED WHERE ACCUMULATIONS REACH 1/2 THE ABOVE GROUND HEIGHT OF THE FENCE.
 - WHERE ENDS OF FILTER FABRIC COME TOGETHER, THEY MUST BE OVERLAPPED, FOLDED AND STAPLED TO PREVENT SEDIMENT BYPASS. THE TOE ANCHOR MUST BE BACK FILLED AND COMPACTED TO A DENSITY EQUAL TO THE SURROUNDING SOILS.

18" FILTER FABRIC FENCE DETAIL
SCALE: NONE

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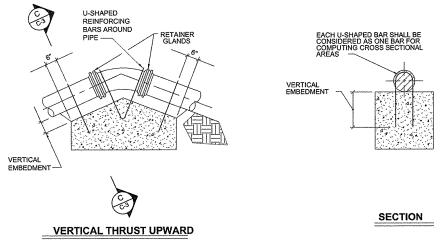


NO.	DATE	REV.	ISSUED FOR/REVIEWED	APP'D
0	01/20/08	SAC	ISSUED FOR BIDDING	SAC
1	11/16/07	C	ISSUED FOR PERMIT	SAC
2	10/10/07	B	ISSUED FOR PRELIMINARY CLIENT REVIEW	SAC
3	10/07/07	A	ISSUED FOR PRELIMINARY CLIENT REVIEW	SAC

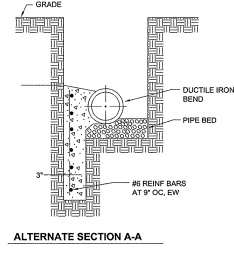
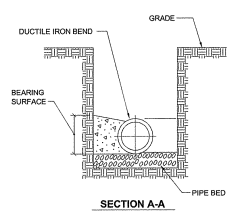
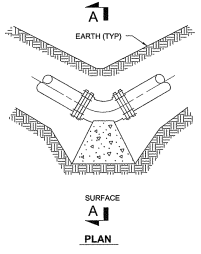
Pennsylvania
American Water
RECOMBONATOR TOWNSHIP, BERKS COUNTY, PENNSYLVANIA
GOLDEN OAKS WELL GO-3 AND FACILITY UPGRADES
WELL GO-3 SITE, ENLARGED PLANS & DETAILS

ISSUED	AS NOTED
BY: [Signature]	BY: [Signature]
CHECKED BY: [Signature]	CHECKED BY: [Signature]
APPROVED BY: [Signature]	APPROVED BY: [Signature]
PROJECT NO. 08158	PROJECT NO. 08158
DRAWING NO.	DRAWING NO.

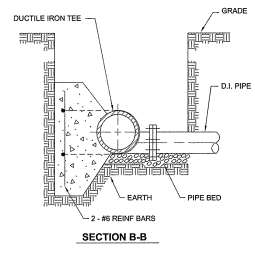
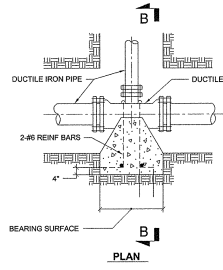
C-3



SECTION C-C



ALTERNATE SECTION A-A



SECTION B-B

THRUST BLOCKING DETAIL
SCALE: NONE

PIPE SIZE	6" AND 8"				10" AND 12"				14" AND 16"			
DEGREE BEND OR DEFLECTION	11 1/4"	22 1/2"	45°	90°	11 1/4"	22 1/2"	45°	90°	11 1/4"	22 1/2"	45°	90°
LENGTH	3.00	4.00	6.00	4.50	6.00	8.00	6.00	8.00	11.00			
WIDTH	3.00	3.00	3.00	3.00	4.00	3.50	3.50	3.50	5.00			
DEPTH	2.00	3.00	4.00	3.00	4.50	5.00	3.50	5.00	5.00			
SQ. IN. REINFORCING	0.17	0.33	0.65	0.37	0.74	1.46	0.68	1.32	2.60			

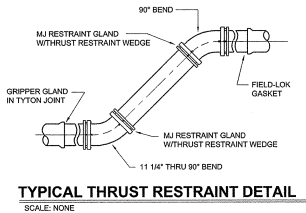
VERTICAL THRUST BLOCKING
UPWARD THRUSTS SCHEDULE OF DIMENSIONS
150 P.S.I. WORKING PRESSURE

MINIMUM SQUARE FEET OF BEARING SURFACE REQUIRED FOR HORIZONTAL THRUST BLOCKING AND VERTICAL THRUSTS DOWNWARD		
PIPE SIZES	6" AND 8"	10" AND 12"
TYPE OF BEARING MATERIAL AND ALLOWABLE LOADS	DEGREE BEND OR DEFLECTION	DEGREE BEND OR DEFLECTION
	11 1/4" 22 1/2" 45° 90°	11 1/4" 22 1/2" 45° 90°
SAND 1 TONS/90 FT	1.50 3.00 6.00 12.00	3.00 6.00 12.00 24.00
SAND & GRAVEL 2 TONS/90 FT	1.00 1.50 3.00 6.00	1.50 3.00 6.00 12.00
CLAY 3 TONS/90 FT	1.00 1.00 2.00 4.00	1.00 2.00 4.00 8.00
SOFT ROCK 5 TONS/90 FT	1.00 1.00 1.50 2.50	1.00 1.50 2.50 5.50
ROCK 20 TONS/90 FT	1.00 1.00 1.00 1.00	1.00 1.00 1.00 1.00

MINIMUM SQUARE FEET OF BEARING SURFACE REQUIRED FOR HORIZONTAL THRUST BLOCKING AND VERTICAL THRUSTS DOWNWARD		
PIPE SIZES	14" AND 16"	18" AND 20"
TYPE OF BEARING MATERIAL AND ALLOWABLE LOADS	DEGREE BEND OR DEFLECTION	DEGREE BEND OR DEFLECTION
	11 1/4" 22 1/2" 45° 90°	11 1/4" 22 1/2" 45° 90°
SAND 1 TONS/90 FT	5.00 11.00 21.50 43.50	6.50 16.50 33.00 66.00
SAND & GRAVEL 2 TONS/90 FT	2.50 5.00 11.00 21.50	4.00 8.50 16.50 33.00
CLAY 3 TONS/90 FT	2.00 3.50 7.00 14.00	3.00 5.50 11.00 22.00
SOFT ROCK 5 TONS/90 FT	1.00 2.00 4.50 8.50	1.50 3.50 6.50 13.00
ROCK 20 TONS/90 FT	1.00 1.00 1.00 2.00	1.00 1.00 1.00 3.00

THRUST BLOCKING
SCHEDULE OF DIMENSIONS

- NOTES:
1. ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI AT THE END OF 28 DAYS.
 2. ALL REINFORCING STEEL SHALL BE DEFORMED BARS.
 3. INSTALL CONCRETE THRUST BLOCKS AT EACH ELBOW, TEE AND CAPPED OR VALVED END FITTINGS LOCATED IN THE HORIZONTAL PLANE.
 4. PAINT ALL EXPOSED STEEL WITH TWO COATS OF ASPHALTY PAINT.
 5. NO COUPLING OR JOINTS SHALL BE COVERED WITH CONCRETE.
 6. ALL THREADS WITH PIPE STRAPS MAY BE USED IN PLACE OF REINFORCING BARS.
 7. ALL THRUST BLOCKS SHOWN ARE INTENDED AS A GUIDE AND SHALL WITHSTAND THE REQUIRED PRESSURE.
 8. RETAINER GLANDS REQUIRED ON ALL MECHANICAL JOINT FITTINGS.
 9. CERTAIN SITUATIONS MAY WARRANT THE USE OF THE RODS, AUTHORIZED BY THE WATER COMPANY ONLY.
 10. PIPING SHALL BE WRAPPED WITH POLYETHYLENE PRIOR TO PLACEMENT OF CONCRETE.



TYPICAL THRUST RESTRAINT DETAIL
SCALE: NONE

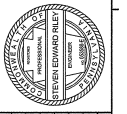
PIPE SIZE	LENGTH OF PIPE REQUIRED (LF)					
	11 1/4"	22 1/2"	45°	90°	TEE	CAP/VALVE
4-INCH	1	2	7	24	24	24
6-INCH	4	7	15	36	36	36
8-INCH	5	9	19	47	47	47

- NOTES:
1. SCHEDULE REFLECTS THE MINIMUM LENGTH OF PIPE REQUIRED TO BE MECHANICALLY RESTRAINED FOR A TEST PRESSURE OF 200 PSI.
 2. COMPLIANCE WITH RESTRAINT SCHEDULE IS MANDATORY.
 3. MECHANICAL RESTRAINT SYSTEM IS IN ADDITION TO CONCRETE THRUST BLOCKING.

DRAWING NOTES

1. REFER TO DRAWING CS-1 FOR GENERAL PROJECT NOTES, DRAWING INDEX AND DRAWING CONVENTIONS.
2. REFER TO DRAWING CS-2 FOR DISCIPLINE SPECIFIC LEGENDS AND ABBREVIATIONS.

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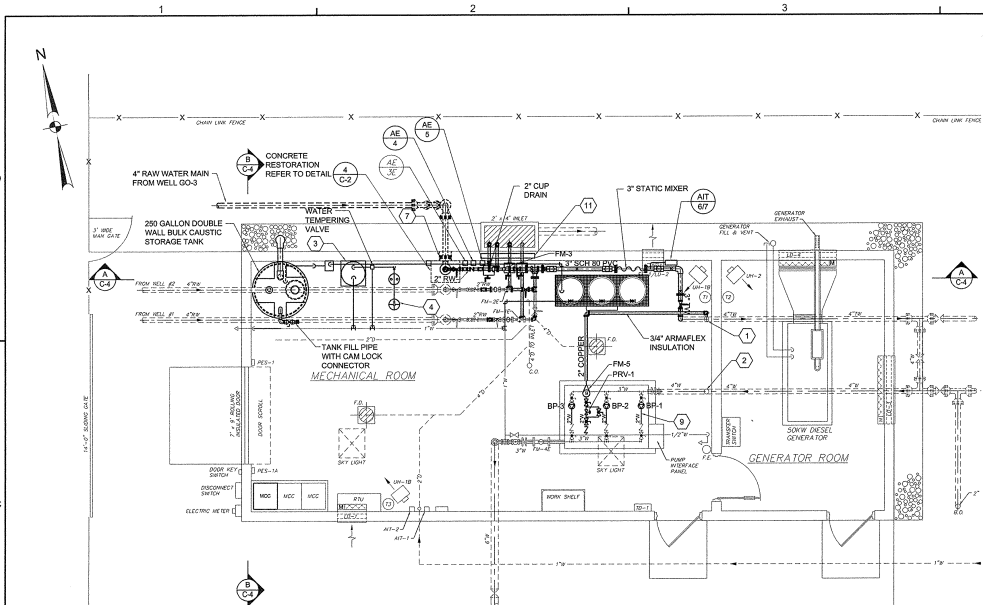


NO.	DATE	REV.	ISSUED FOR	APPROVED
0	04/16/08		ISSUED FOR DESIGN	SAC
1	11/18/07	C	ISSUED FOR SHOP DRAWING	SAC
2	10/07/07	B	ISSUED FOR PRE-FINAL PAV. CLIENT REVIEW	SAC
3	10/07/07	A	ISSUED FOR PRELIMINARY CLIENT REVIEW	SAC
			ISSUED FOR REVISION	APPD

Pennsylvania
American Water
DISCOMBAMONOR TOWNSHIP, BERKS COUNTY, PENNSYLVANIA
GOLDEN OAKS WELL GO-3 AND FACILITY UPGRADES
CIVIL / MECH
CONSTRUCTION DETAILS DETAILS

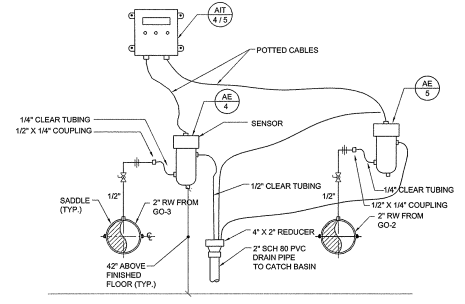
SCALE:	AS NOTED
PREPARED BY:	DTM
CHECKED BY:	JOB
APPROVED BY:	SAC
PROJECT NO.:	0158141
DRAWING NO.:	

C-4



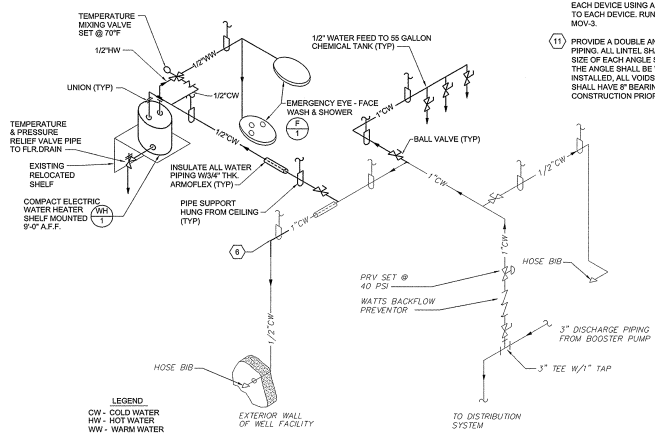
PLAN - GOLDEN OAKS PUMPING FACILITY

SCALE: 1/4" = 1'-0"
0 6" 1' 2' 4'



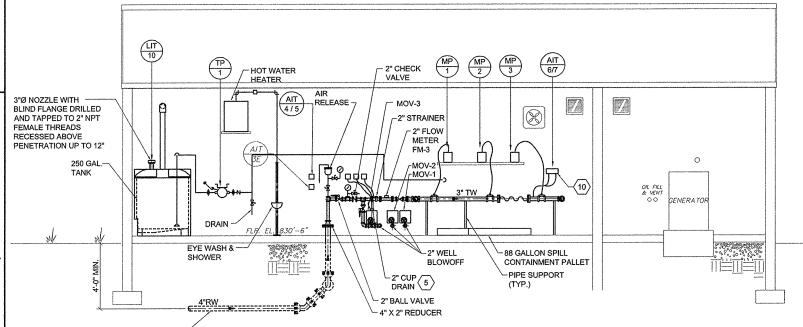
TURBIDIMETER PIPING DETAIL

SCALE: NONE



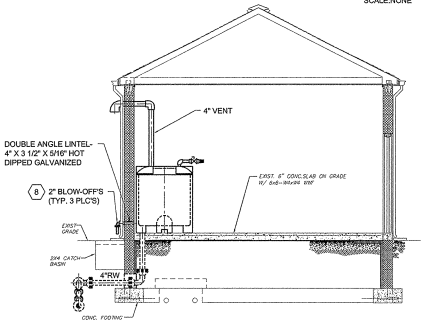
DOMESTIC WATER PIPING SCHEMATIC

SCALE: NONE



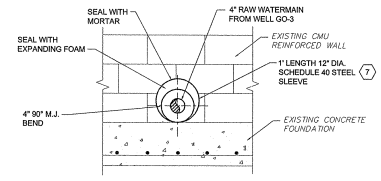
SECTION A-C4

SCALE: 1/4" = 1'-0"
0 6" 1' 2' 4'



SECTION B-C4

SCALE: 1/4" = 1'-0"
0 6" 1' 2' 4'



FOUNDATION PENETRATION DETAIL

SCALE: 3/4" = 1'-0"
0 6" 1' 2'

DRAWING NOTES

1. REFER TO DRAWING GS-1 FOR GENERAL PROJECT NOTES, DRAWING INDEX AND DRAWING CONVENTIONS.
2. REFER TO DRAWING CS-2 FOR DISCIPLINE SPECIFIC LEGENDS AND ABBREVIATIONS.

KEYED DRAWING NOTES

1. CONNECT 2" RETURN LINE TO EXISTING 2" STUB.
2. CAP 4 X 2 REDUCER WITH BLANK BLIND FLANGE.
3. INSTALL NEW WATER HEATER ON EXISTING RELOCATED SHELF.
4. EMERGENCY SINK / SHOWER COMBO TO DRAIN ONTO FLOOR. SECURE EQUIPMENT PER MANUFACTURERS INSTRUCTIONS.
5. PROVIDE CUP DRAIN TOPPED WITH 4" X 2" REDUCER AT 3' ABOVE FINISHED FLOOR. PIPE TO EXISTING 2" X 4" CATCH BASIN.
6. PROVIDE COPPER PIPE TO ELIMINATE BENDING AROUND PREVIOUS LOCATION OF WALL SHELF.
7. 1" LENGTH 1/2" DIA. SCHEDULE 40 STEEL SLEEVE TO BE INSTALLED THROUGH FOUNDATION WALL PENETRATION. SEAL WITH MORTAR ON OUTSIDE OF SLEEVE AND EXPANDING FOAM INSULATION ON INSIDE.
8. CORE DRILL EXISTING CMU TO ACCOMMODATE INSTALLATION OF 2" WELL BLOW-OFF'S AND INSTRUMENT DRAIN. MAINTAIN AIR GAP.
9. PROVIDE NEW 2" BRONZE PIPE, VALVE AND APPURTENANCES.
10. CHLORINE ANALYZER IS INTEGRAL TO THE BASE UNIT. THE PH PROBE IS SELF CONTAINED BUT CONNECTS TO THE BASE UNIT FOR CONTROL AND POWER WIRING. THE SAMPLE TAP WILL BE IN THE 3" HEADER BEYOND THE STATIC MIXER AND PRIOR TO THE CORROSION INHIBITOR INJECTION POINT. RUN 1/2" RIGID TUBING TO EACH DEVICE USING A VALVE AFTER THE TAP AND A VALVE PRIOR TO EACH DEVICE. RUN DRAIN TUBING TO 2" CUP DRAIN BEHIND MOV-3.
11. PROVIDE A DOUBLE ANGLE LINTEL ABOVE THE EXISTING AND NEW PIPING. ALL LINTEL SHALL BE A36 STEEL HOT DIPPED GALVANIZED. SIZE OF EACH ANGLE SHALL BE 4" X 3" X 1/2" X 5/16". THE LONG LEG OF THE ANGLE SHALL BE VERTICAL. AFTER THE PIPING HAS BEEN INSTALLED, ALL JOISTS SHALL BE FILLED WITH GROUT. THE LINTEL SHALL HAVE 8" BEARING EACH END. SHORE EXISTING BUILDING CONSTRUCTION PRIOR TO INSTALLING THE LINTEL.

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NO.	DATE	REV.	BY	APP'D.
0	01/15/08		ISSUED FOR BIDDING	
1	11/14/07		ISSUED FOR PERMIT	
2	10/17/07		ISSUED FOR PRELIMINARY CLIENT REVIEW	
3	08/07/07		ISSUED FOR PRELIMINARY CLIENT REVIEW	
			ISSUED FOR REVISED	

Pennsylvania American Water
RISCOMBOROUGH TOWNSHIP, BERKS COUNTY, PENNSYLVANIA
GOLDEN OAKS WELL GO-3 AND FACILITY UPGRADES
WELL 1 PUMPING FACILITY PIPING PLAN, SECTIONS AND DETAILS

SCALE	AS NOTED
PREPARED BY	LYNN
CHECKED BY	JOB SMITH
APPROVED BY	SMC
PROJECT NO.	11158.01
DRAWING NO.	

C-5

ELECTRIC OPERATED FLOW CONTROL VALVES

ITEM NO.	SERVICE	VALVE TYPE	TYPE OF CONTROL	FLOW (GPM)		SIZE (IN)	VALVE BASIS OF DESIGN			ELECT. MOTOR OPERATION BASIS OF DESIGN			NOTES	REMARKS	
				MIN	MAX		MANUFACTURER	MODEL	F.L.A.	L.R.A.	VOLTAGE	MANUFACTURER			MODEL
MOV-1	RAW WELL WATER	BALL VALVE	OPEN / CLOSE	0	55	2"	WATTS	86600-55	1.65	-	120-140	EM CONTROLS	LUC-A-HQ-015	-	BALL VALVE INSTALLED AND SETUP BY MANUFACTURER REP.
MOV-2	RAW WELL WATER	BALL VALVE	OPEN / CLOSE	0	39	2"	WATTS	86600-39	1.65	-	120-140	EM CONTROLS	LUC-A-HQ-015	-	BALL VALVE INSTALLED AND SETUP BY MANUFACTURER REP.
MOV-3	RAW WELL WATER	BALL VALVE	OPEN / CLOSE	0	39	2"	WATTS	86600-39	1.65	-	120-140	EM CONTROLS	LUC-A-HQ-015	-	BALL VALVE INSTALLED AND SETUP BY MANUFACTURER REP.

SUBMERSIBLE PUMP SCHEDULE

ITEM NO.	SERVICE	FLOW (GPM)	HEAD (FT.)	MOTOR H.P.	RPM	CONNECTIONS		VOLTAGE	BASIS OF DESIGN		STAGES	PUMP SETTING	PUMP SHUT OFF FEET / PSI
						RISER	FLG OUTLET		MANUFACTURER	MODEL SIZE			
GO-3	WELL WATER	50	238	5	3450	2"	4"	208-3-60	AERMOTOR	A-8550-500	15	258FT	440/90

BOOSTER PUMP SCHEDULE

ITEM NO.	SERVICE	FLOW (GPM)	TDH (FT.)	PUMP SHUT OFF (FEET / PSI)	CONNECTIONS		HP	RPM	VOLTAGE	BASIS OF DESIGN		NOTES
					INLET	OUTLET				MANUFACTURER	MODEL SIZE	
BP-1	FINISHED WATER	90	300	394/170	2"	2"	10	3470	208-3-60	GRUNDFOS	CR15-9(E)	(1)
BP-2	FINISHED WATER	90	300	394/170	2"	2"	10	3470	208-3-60	GRUNDFOS	CR15-9(E)	(1)
BP-3	FINISHED WATER	90	300	394/170	2"	2"	10	3470	208-3-60	GRUNDFOS	CR15-9(E)	(1)

NOTES: (1) EXISTING PUMPS WILL BE REMOVED AND NEW PUMPS RETROFITTED TO THE PRE-PACKAGE SKID. REFER TO SPECIFICATIONS AND DETAILS FOR FURTHER INSTRUCTION. CONTRACTOR TO PROVIDE POWER AND CONTROL WIRE AND TO ACCOMMODATE INSTALLATION. INVERTER DUTY MOTORS REQUIRED.

CHEMICAL PUMPS

ITEM NO.	SERVICE	MIN FLOW (GPM)	EST. FLOW (GPM) (3)	MAX FLOW (GPM)	SYSTEM BACK PRESSURE - PSI (1)	CONNECTIONS		VOLTAGE	BASIS OF DESIGN		NOTES
						INLET	OUTLET		MANUFACTURER	SERIES	
MP-1	CORROSION INHIBITOR	0.001	0.011	0.42	5	1/4" (O.D.)	1/4" (O.D.)	115-140	LMI	AA971-4505H	(2)
MP-2	CAUSTIC SODA (2%)	0.002	0.31	1.00	5	3/8" (O.D.)	3/8" (O.D.)	115-140	LMI	AA951-4905H	(2)
MP-3	SODIUM HYPOCHLORITE	0.001	0.043	0.42	5	1/4" (O.D.)	1/4" (O.D.)	115-140	LMI	AA971-4505H	(2)
TP-1	CAUSTIC SODA	0	800	900	6	1 1/2" (O.D.)	1 1/2" (O.D.)	115-140	VANTON	90	-

NOTES: (1) NOT INCLUDING BACK PRESSURE VALVES.
 (2) PROVIDED WITH (5) FUNCTION VALVE. INSTALL ON EXISTING RELOCATED WALL MOUNTED SHELF AND PROVIDE ONE SPARE METERING PUMP FOR EACH CHEMICAL.
 (3) ESTIMATED DOSAGE AT MAX RAW WATER FLOW

ELECTRONIC INSTRUMENTATION SCHEDULE

ITEM	DESCRIPTION	VOLTAGE	RANGE	OUTPUT	MANUFACTURER	MODEL	SIZE	REMARKS
LE-3	WELL LEVEL 40 SENSOR	24 VDC	0-230 FT	4-20 MA	DRUCK	PTX1230	69/10	W5000 FT OF CABLE
LE-4	TANK LEVEL SENSOR	24 VDC	0-25 FT	4-20 MA	DRUCK	PTX1230	69/10	W1775 FT OF CABLE (2)
FA-3	RAW WATER FLOW METER	24 VDC	4-200 GPM	4-20 MA	SCHLUMBERGER/NEPTUNE	HP TURBINE	2"	W/ TRUCKLINE TRANSMITTER
FMA-5	REGULATION FLOW METER	NONE	4-200 GPM	NONE	SCHLUMBERGER/NEPTUNE	HP TURBINE	2"	-
AIT-4 & 5	TURBIDITY METER / PROBE / CONTROLLER	120 VAC	0.001 - 10 NTU	4-20 MA	HACH	T720E-SC100	(3)	(4)
LS-5	CONTAINMENT PALLET SWITCH	NONE	-	OPEN/CLOSE	W.E. ANDERSON	L1-S	-	SPILL CONTAINMENT PALLET
LS-6	DAY TANK SWITCH	NONE	-	OPEN/CLOSE	W.E. ANDERSON	F7-SS2	-	CAUSTIC DAY TANK
LIT-7,8,9,10	ULTRA SONIC LEVEL INDICATOR / TRANSMITTER	24 VDC	0-5 FT	4-20 MA	DIXELBROOK	L180N	-	-
AIT-6 & 7	CL2 & pH ANALYZER	120 VAC	CL2 0-2 MG/L PH 4-10	TWO 4-20 MA	WALLACE & TIERNAN	DEPLUX 3 WI PH PROBE	-	W/ TWO AO CONNECTIONS

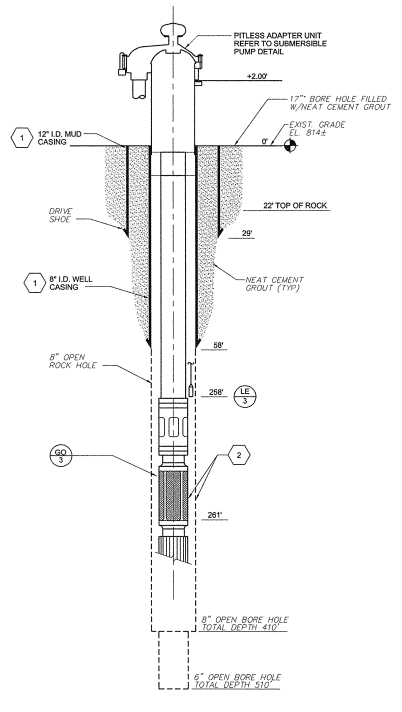
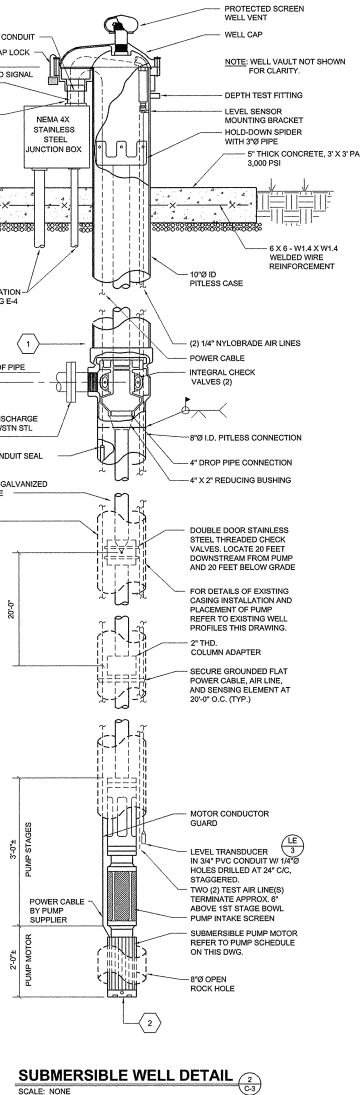
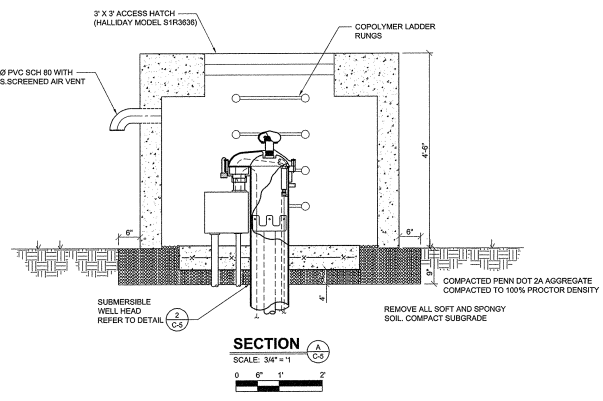
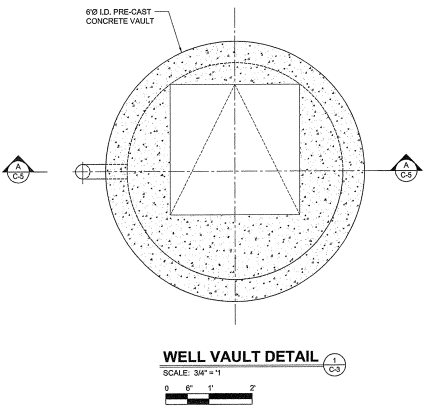
NOTES: (1) CONNECT TO SECURITY INPUT BOARD IN RTU/DIALER
 (2) PROVIDE A SECOND SPARE TRANSMITTER AND FORWARD TO OWNER
 (3) 1/4" INLET AND 1/2" OUTLET
 (4) ONE INSTRUMENT CONTROL, REQUIRED FOR TWO TURBIDITY METERS SUPPLIED WITH 6' CABLE (PROBE TO CONTROLLER)

DRAWING NOTES

- REFER TO DRAWING CS-1 FOR GENERAL PROJECT NOTES, DRAWING INDEX AND DRAWING CONVENTIONS.
- REFER TO DRAWING CS-2 FOR DISCIPLINE SPECIFIC LEGENDS AND ABBREVIATIONS.

KEYED DRAWING NOTES

- REMOVE EXISTING TEMPORARY WELL CAP. SECTION OF EXISTING TANK AND MUD CASING. PROVIDE A 10" X 10" SCHEDULE 40 STEEL BUTT WELDED REDUCER TO ACCOMMODATE INSTALLATION OF FITLESS ADAPTOR
- DISINFECT WELL AND SUBMERSIBLE WELL PUMP IN STRICT ACCORDANCE WITH AWWA-C-654

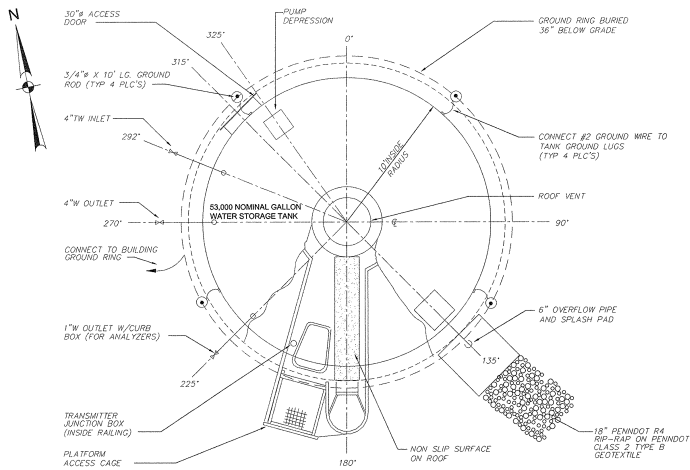


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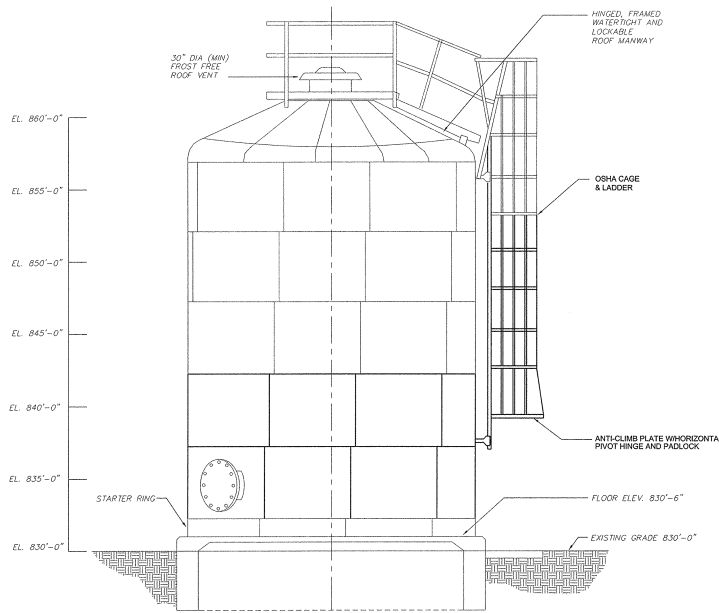
Pennsylvania American Water
 BERKS COUNTY, PENNSYLVANIA
GOLDEN OAKS WELL GO-3 AND FACILITY UPGRADES
 CIVIL / MECH
 EQUIPMENT SCHEDULES, SECTIONS AND DETAILS

NO.	REV.	DATE	BY	CHK	APPD.
1	0				
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3	2				
4	3				
5	4				
6	5				
7	6				
8	7				
9	8				
10	9				

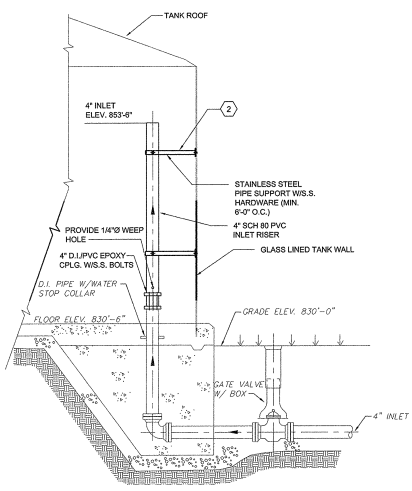
AS NOTED
 DRAWN BY: JSM
 CHECKED BY: JSM
 APPROVED BY: JSM
 PROJECT NO: 10000000000000000000
 DRAWING NO: C-6



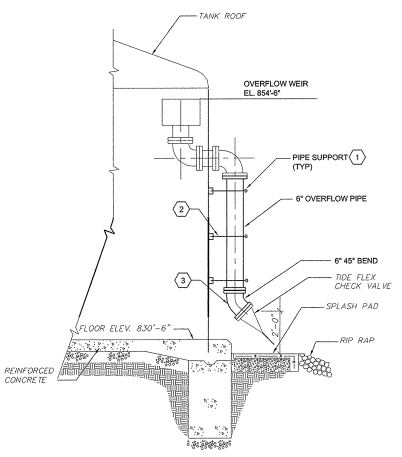
PLAN VIEW - GOLDEN OAKS WATER TANK
 SCALE: 1/4" = 1'-0"
 0 6" 1' 2' 4' 6'



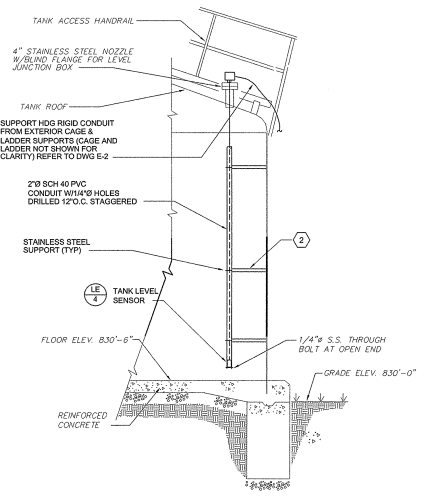
TANK ELEVATION
 SCALE: 1/4" = 1'-0"
 0 6" 1' 2' 4' 6'



INLET DETAIL
 SCALE: NONE



OVERFLOW DETAIL
 SCALE: NONE



TRANSMITTER DETAIL
 SCALE: NONE

DRAWING NOTES

- REFER TO DRAWING CS-1 FOR GENERAL PROJECT NOTES, DRAWING INDEX AND DRAWING CONVENTIONS.
- REFER TO DRAWING CS-2 FOR DISCIPLINE SPECIFIC LEGENDS AND ABBREVIATIONS.
- THIS DRAWING DEPICTS THE MODIFICATION OF AN EXISTING A.O. SMITH A NATURE. REFER TO SPECIFICATIONS FOR SCOPE OF WORK.
- THE TANK SHALL CONFORM TO THE REQUIREMENTS OF AWWA STANDARD D-1153 AND ANSI/SPR STANDARD #1.

KEYED DRAWING NOTES

- PAIN OVERFLOW PIPE SUPPORTS AND TRANSMITTER SENSOR CONDUIT SUPPORTS WITH WHITE NSF EPOXY PAINT. BASIS OF DESIGN: TMECC POTAFIX LT, SERIES 40
- PROVIDE ADJUST PIPE / CONDUIT BRACKETS TO NEW LOCATION. PROVIDE EQUITDISTANT SPACING.
- ROLL 45° BEND FITTING TO FLOW WATER TO CENTER OF CONCRETE PAD. (NOT SHOWN FOR CLARITY)
- REMOVE AND PROVIDE NEW INTERIOR ANODES.
- WORKED DESCRIBES AND AS NOTED ON THIS DRAWING SHALL BE PROVIDED BY NORTHEAST AQUASTORE AS A SUB-CONTRACTOR TO CONTRACTOR. CONTRACTOR SHALL SUPPLY SENSOR LE-4 TO NORTHEAST AQUASTORE.

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NO.	DATE	REV.	BY	APPD.
0	01/14/08		SMC	SMC
1	01/14/07		SMC	SMC
2	03/07		SMC	SMC
3	03/07		SMC	SMC

Pennsylvania American Water
 RUSCOBANHAWK TOWNSHIP, BERKS COUNTY, PENNSYLVANIA
GOLDEN OAKS WELL GO-3 AND FACILITY UPGRADES
 CIVIL
 EXISTING CLEARWELL TANK PLAN, SECTION S & DETAILS

SCALE:	AS NOTED
PREPARED BY:	EPH
CHECKED BY:	EROSMITH
APPROVED BY:	SMC
PROJECT NO.:	8158-01
DRAWING NO.:	

C-7

15.6 ABOVE GRADE INTERIOR PIPING

- A. RAW, TREATED AND FINISHED WATER PIPING LOCATED WITHIN MECHANICAL ROOM: TYPE K RIGID COPPER, SOLDERED CONNECTIONS FOR PIPE LESS THAN 2" DIAMETER AND NPT THREADS FOR 2" DIAMETER AND ABOVE, SCHEDULE 80 PVC SOLVENT WELDED PIPE WITH FLANGE CONNECTIONS TO TRANSITION TO UNLIKE PIPE MATERIALS.
- B. BALL VALVES SHALL BE NICKEL PLATED BRASS BODY, TYPE 316 STAINLESS STEEL FULL PORT BALL, TEFLON SEATS, VITON SEALS, LEVER HANDLE AND THREADED ENDS
- C. CHECK VALVE SHALL BE BRONZE Y PATTERN BODY SWING CHECK TYPE WITH RENEWABLE BRONZE DISC AND THREADED ENDS.
- D. DOMESTIC WATER PIPING TO BE TYPE K RIGID COPPER W/ SOLDER FITTINGS/JOINTS

15.7 PRESSURE TESTING/FIELD CALIBRATION

- A. TEST ALL NEW PROCESS PIPING UTILIZING WATER AND AIR METHODS AND TEST TO ZERO PRESSURE LOSS.
- B. PROVIDE A MINIMUM OF 2 HRS PER DEVICE FOR FACTORY CERTIFIED TECHNICIAN FOR START UP, TESTING AND CALIBRATION OF ALL EQUIPMENT.

15.8 COMPACT ELECTRIC WATER HEATER (WH-1)

- A. THERMOSTATICALLY CONTROLLED WALL/SHelf MOUNTED 20 GALLON GLASS LINED 180° X 20" WATER HEATER WITH 2000 WATT ELEMENT RELIEF VALVE. VOLTAGE 208-240 VOLT SINGLE PHASE W/PT
- B. BASIS OF DESIGN: RHHEM-RUAD MODEL EGSP20

15.9 EMERGENCY EYE-FACE WASH / SHOWER STATION (F-1)

- A. 1 1/2" DIAMETER STAINLESS STEEL BOWL W/10 DRAIN TRAP, CHROME PLATED EYE WASH WITH FACE RING, CHROME PLATED STAY OPEN 1/2" NPT CONNECTION BALL VALVE, 1/4" DRAIN TAILPIECE AND HAND OPERATED PUSH PLATE, 10 5/8" GREEN ABS PLASTIC SHOWERHEAD WITH INTEGRAL 20 GPM FLOW CONTROL, CHROME PLATED STAY OPEN BALL VALVE WITH STAINLESS STEEL FULL ROD AND TRIANGULAR HANDLE, EMERGENCY SIGN AND TEST TAG MOUNTED ON OR NEAR STATION IN FLAM VIEW.
- B. BASIS OF DESIGN: HAWG CORPORATION MODEL 8300

15.10 WATER-TEMPERING EQUIPMENT

- A. THERMOSTATIC MIXING VALVE, DESIGNED TO PROVIDE 85 DEG F TEPID, POTABLE WATER AT EMERGENCY PLUMBING FIXTURES, TO MAINTAIN TEMPERATURE AT PLUS OR MINUS 1 DEGREE F THROUGHOUT REQUIRED 15-MINUTE TEST PERIOD, AND IN CASE OF UNIT FAILURE TO CONTINUE COLD-WATER FLOW, WITH UNION CONNECTIONS, CONTROLS, METAL PIPING, AND CORROSION-RESISTANT ENCLOSURE.
- B. WATER-TEMPERING EQUIPMENT SHALL BE SAME MANUFACTURER AS COMBINATION SHOWER/EYE-FACE WASH UNIT.

15.11 CHEMICAL CONTAINMENT DECK

- A. 88 GALLON SUMP CAPACITY WITH DIMENSIONS OF 78" X 28" X 5.75" TO HOLD 3-85 GALLON DRUMS, 100% POLY PREDRILLED AND PLUGGED.
- B. SUPPLY (1) SPARE BLADDER PIG @ PAK 525
- C. BASIS OF DESIGN: PIG @ PAK 626

15.12 PRESSURE RELIEF VALVE (PRV-1)

- A. THE PRESSURE RELIEF VALVE SHALL OPEN ON A RISE IN INLET PRESSURE TO PROTECT THE SYSTEM FROM EXCESSIVE PRESSURES IF A PRESSURE REVERSAL OCCURS THE VALVE SHALL CLOSE TO PREVENT REVERSE FLOW, THE DIAPHRAGM ASSEMBLY SHALL BE THE ONLY MOVING PART AND SHALL FORM A SEALED CHAMBER IN THE UPPER PORTION OF THE VALVE, SEPARATING OPERATING PRESSURE FROM LINE PRESSURE, VALVE BODY AND COVER SHALL BE OF CAST DUCTILE IRON WITH STAINLESS STEEL TRIM TYPE 316. THE VALVE SHALL BE EPOXY COATED BY THE HEAT FUSION PROCESS ON INTERIOR AND EXTERIOR SURFACES TO A THICKNESS OF 5-8 MILS. THE VALVE SHALL CONTAIN A RESILIENT, SYNTHETIC RUBBER DISC WITH A RECTANGULAR CROSS-SECTION CONTAINED ON THREE AND ONE-HALF SIDES BY A DISC RETAINER AND FORMING A TIGHT SEAL AGAINST A SINGLE REMOVABLE SEAT INSERT. THE DIAPHRAGM ASSEMBLY CONTAINING A NON-MAGNETIC 303 STAINLESS STEEL STEM OF SUFFICIENT DIAMETER TO WITHSTAND HIGH HYDRAULIC PRESSURES SHALL BE FULLY GUIDED AT BOTH ENDS BY A BEARING IN THE VALVE COVER AND AN INTERIOR BEARING IN THE VALVE SEAT. THE FLEXIBLE, NON-WICKING, FDA APPROVED DIAPHRAGM SHALL CONSIST OF NYLON FABRIC BONDED WITH SYNTHETIC RUBBER COMPATIBLE WITH THE OPERATING FLUID. THE MAIN VALVE SEAT AND THE STEM BEARING IN THE VALVE COVER SHALL BE REMOVABLE.
- B. THE VALVE MANUFACTURER SHALL WARRANT THE VALVE TO BE FREE OF DEFECTS IN MATERIAL AND WORKMANSHIP FOR A PERIOD OF THREE YEARS FROM DATE OF SHIPMENT PROVIDED THE VALVE IS INSTALLED AND USED IN ACCORDANCE WITH ALL APPLICABLE INSTRUCTIONS.
- C. BASIS OF DESIGN: CL-A-VAL MODEL 50-01

15.13 HORIZONTAL MECHANICAL LEVEL SWITCH (LS-5)

- A. FLOAT AND STEM SHALL BE MADE OF POLYPHENYLENE SULFIDE (PPS) MATERIAL, SPRING AND PIN SHALL BE SS316, AND CAN WITHSTAND TEMPERATURES TO 212 DEGREES FAHRENHEIGHT AND PRESSURES TO 150 PSIG
- B. SHALL ACCEPT 24 VDC INPUT WITH 16 AWG CONNECTIONS
- C. BASIS OF DESIGN: W.E. ANDERSSON MODEL L-8

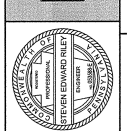
15.14 VERTICAL MECHANICAL LEVEL SWITCH (LS-6)

- A. FLOAT AND STEM SHALL BE MADE OF SS316 MATERIAL AND CAN WITHSTAND TEMPERATURES TO 300 DEGREES FAHRENHEIGHT AND PRESSURES TO 450 PSIG.
- B. SHALL ACCEPT 24 VDC INPUT WITH 22 AWG CONNECTIONS.
- C. BASIS OF DESIGN: W.E. ANDERSSON MODEL F7-852

15.15 PIPE INSULATION

- A. INSULATION SHALL BE 3/8" WALL THICKNESS, FLEXIBLE ELASTOMERIC MATERIAL, BLACK IN COLOR, AND SUPPLIED AS UNSLIT TUBING. INSULATION WILL BE RESISTANT TO MOLD.
- B. BASIS OF DESIGN: ARMAFLEX TUBES

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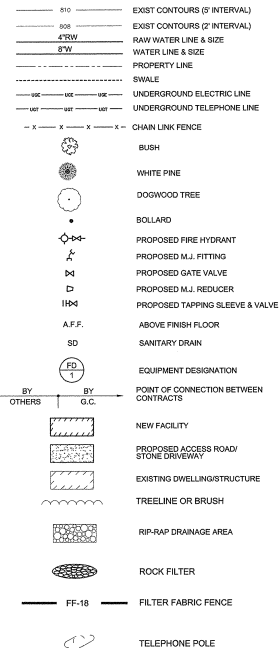
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2	11/16/07	B	ISSUED FOR PRELIMINARY CLIENT REVIEW	SAC	APPROVED
3	01/03/07	C	ISSUED FOR PRELIMINARY CLIENT REVIEW	SAC	APPROVED
4	01/03/07	D	ISSUED FOR PRELIMINARY CLIENT REVIEW	SAC	APPROVED

Pennsylvania
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 TOWNSHIP OF GOLDEN OAKS
GOLDEN OAKS WELL GO-3 AND FACILITY UPGRADES
 CIVIL / MECH
 GENERAL / MECHANICAL TECHNICAL SPECIFICATIONS

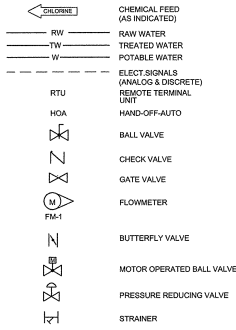
SCALE:	AS NOTED
PREPARED BY:	DYR
CHECKED BY:	JOBSON/SMITH
APPROVED BY:	SAC
PROJECT NO:	81530-01
DRAWING NO:	

C-9

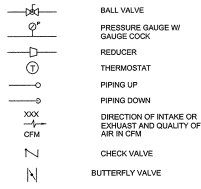
CIVIL / INFRASTRUCTURE LEGEND



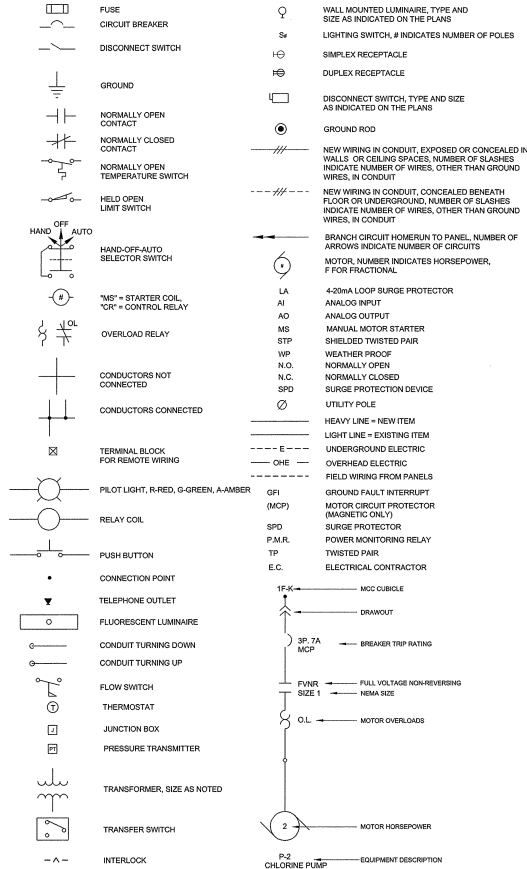
P & ID LEGEND



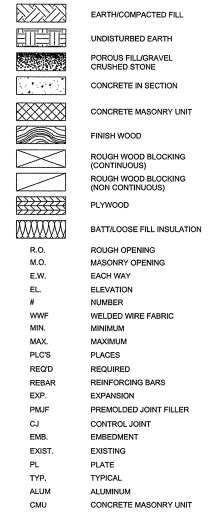
MECHANICAL LEGEND



ELECTRICAL LEGEND



ARCHITECTURAL LEGEND



INSTRUMENTATION SYMBOL LEGEND

SYMBOL	DESCRIPTION	INSTALLATION
○	MOUNTED LOCALLY	INSTRUMENT SYMBOLS
○	MOUNTED ON FACE OF PANEL	INSTRUMENT SYMBOLS
○	MOUNTED BEHIND PANEL DOOR	INSTRUMENT SYMBOLS
○	ALARM LIGHT	INSTRUMENT SYMBOLS
□	NOT ACCESSIBLE TO OPERATOR	DIFFERENTIALLY LOCKED SYMBOLS FOR SHARED INSTRUMENTS
□	ACCESSIBLE TO OPERATOR	DIFFERENTIALLY LOCKED SYMBOLS FOR SHARED INSTRUMENTS
□	AUXILIARY LOCATION	DIFFERENTIALLY LOCKED SYMBOLS FOR SHARED INSTRUMENTS
□	NOT ACCESSIBLE TO OPERATOR	DIFFERENTIALLY LOCKED SYMBOLS FOR SHARED INSTRUMENTS
□	ACCESSIBLE TO OPERATOR	DIFFERENTIALLY LOCKED SYMBOLS FOR SHARED INSTRUMENTS
◇	COMPLEX OR UNDEFINED INTERLOCK	DIFFERENTIALLY LOCKED SYMBOLS FOR SHARED INSTRUMENTS

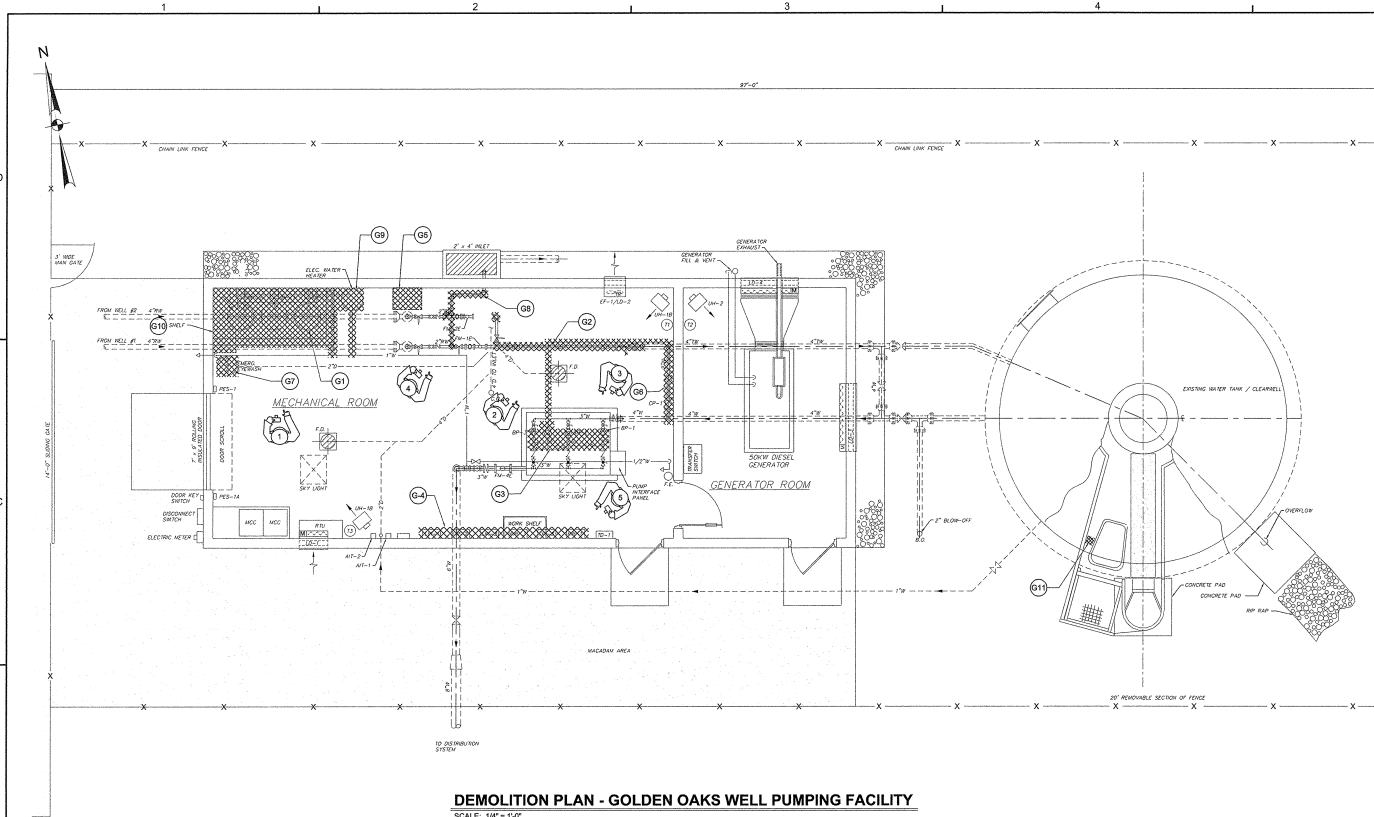
INSTRUMENTATION DEVICE SCHEDULE	
FIRST LETTER	SUCCEEDING LETTERS
MEASURED VARIABLE	DISPLAY OR OUTPUT FUNCTION
A ANALYSIS	ALARM
B BURNER	-
C CHLORINE	CONTROL
D DENSITY DIFFERENTIAL	-
E VOLTAGE	PRIMARY ELEMENT
F FLOW RATE	-
G -	GLASS/GAUGE
H HAND	HIGH
I CURRENT	INDICATE
J POWER	SCAN
K TIME	CONTROL STATION
L LEVEL	LOW/LIGHT
M MOISTURE/AMFUNCTION	MIDDLE
N TURBIDITY	-
O -	ORIFICE
P PRESSURE/VACUUM	-
Q QUANTITY	INTEGRATE/TOTALIZE
R REMOTE	RECORDER/PRINT
S SPEED/FREQUENCY	SWITCH
T TEMPERATURE/TORQUE	TRANSMIT
U MULTIVARIABLE	MULTIFUNCTION
V VISCOSITY/VIBRATION	VALVE
W WEIGHT	-
X AS DEFINED	RELAY
Y STATUS	COMPUTING OR SIGNAL CONVERTING
Z POSITION	DRIVE/ACTUATE

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 GOLDEN OAKS WELLS GO-3 AND FACILITY UPGRADES
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 DISCIPLINE SPECIFIC LEGENDS

NO.	REV.	DATE	ISSUED FOR/REVIEWED
0	0	01/15/08	ISSUED FOR BIDDING
1	1	11/18/07	ISSUED FOR PRELIMINARY CLIENT REVIEW
2	2	10/30/07	ISSUED FOR PRELIMINARY CLIENT REVIEW
3	3	09/20/07	ISSUED FOR PRELIMINARY CLIENT REVIEW
4	4	08/07	ISSUED FOR PRELIMINARY CLIENT REVIEW
5	5	08/07	ISSUED FOR PRELIMINARY CLIENT REVIEW

SCALE: N/A
 PREPARED BY: DVM
 CHECKED BY: JORDAN SMITH
 APPROVED BY: SMC
 PROJECT NO: 013464
 DRAWING NO: CS-2



DEMOLITION PLAN - GOLDEN OAKS WELL PUMPING FACILITY

SCALE: 1/4" = 1'-0"
 0 6" 1' 2' 4' 8'

DRAWING NOTES

- REFER TO DRAWING CS-1 FOR GENERAL PROJECT NOTES, DRAWING INDEX AND DRAWING CONVENTIONS.
- REFER TO DRAWING CS-2 FOR DISCIPLINE SPECIFIC LEGENDS AND ABBREVIATIONS.

KEYED GENERAL / MECHANICAL DEMOLITION NOTES

- REMOVE CHEMICAL DRUMS AND METERING PUMPS, NaOCl AND INHIBITOR TANK TO BE RELOCATED. PUMPS TO BE KEPT AS SPARES AND RETURN TO OWNER. REMOVE CONCRETE SPILL CONTAINMENT DIRT, TUBING, ASSOCIATED PIPING, AND STAINLESS STEEL SHELF. SHELF TO BE RELOCATED. REMOVE COPPER POTABLE WATER PIPING. REMOVE WATER FIXTURES.
- REMOVE RAW WATER PIPING, FITTINGS, CHEMICAL TUBING AND SUPPORTS AS SHOWN. THE 2-INCH PIPE SHALL BE REMOVED FROM THE TEE TO AND INCLUDING THE 4-INCH THREADED BLIND FLANGE.
- REMOVE BOOSTER PUMPS, SECTIONS OF DISCHARGE PIPING, PRV'S AND ASSOCIATING PIPING AND RECIRCULATING FLOW METER AND RETURN TO OWNER.
- REMOVE CHART RECORDERS AND RETURN TO OWNER.
- SAW CUT FLOOR (APPROX. 2' X 1.5') AND HAND EXCAVATE TO DEPTH TO ACCOMMODATE INSTALLATION OF 4" RW FROM WELL GO-3.
- REMOVE 2" PIPE, REMOVE PRESSURE GAUGES AND 3/4" RECIRCULATION LINE. REMOVE SHELF HOLDING RECIRCULATION PUMP.
- DISCONNECT EYE WASH AT DRAIN AND SUPPLY CONNECTIONS. REMOVE EYE WASH FROM WALL. CUT DRAIN PIPE FLUSH TO FLOOR AND CAP.
- REMOVE WATER TO WASTE 2" PIPING FROM 90° BENDS TO PIPE EXTING THROUGH WALL. REMOVE MOTORIZED BALL VALVE AND RETURN TO OWNER.
- REMOVE EXISTING 55-GALLON WATER HEATER AND RETURN TO OWNER. REMOVE ALL DOMESTIC WATER PIPING IN NORTH WEST CORNER OF BUILDING THAT IS BELOW CEILING HANGER LEVEL.
- RELOCATE EXISTING WATER HEATER SELF TO LOCATION OF NEW WATER HEATER.
- REMOVE EXISTING SUBMERSIBLE LEVEL TRANSDUCER

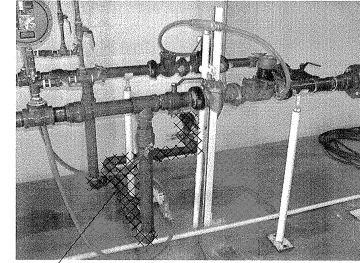


IMAGE 4
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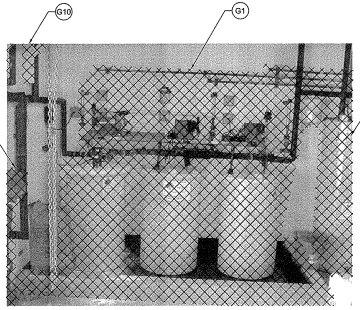


IMAGE 1
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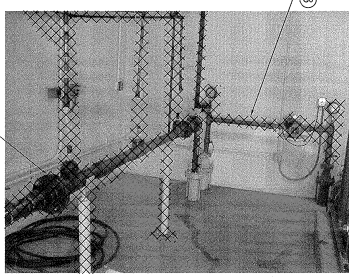


IMAGE 2
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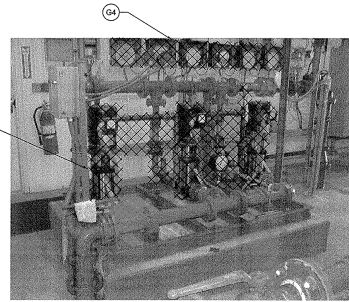


IMAGE 3
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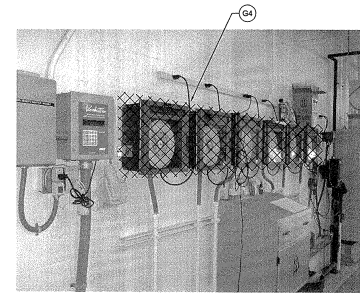


IMAGE 5
SCALE: NONE

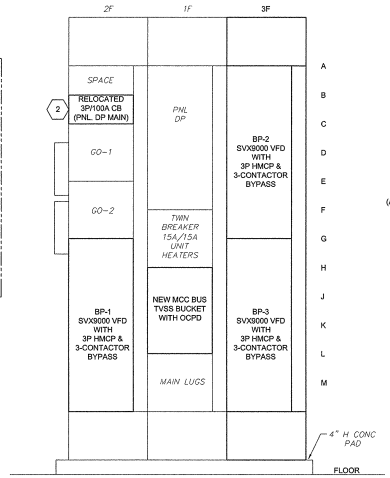
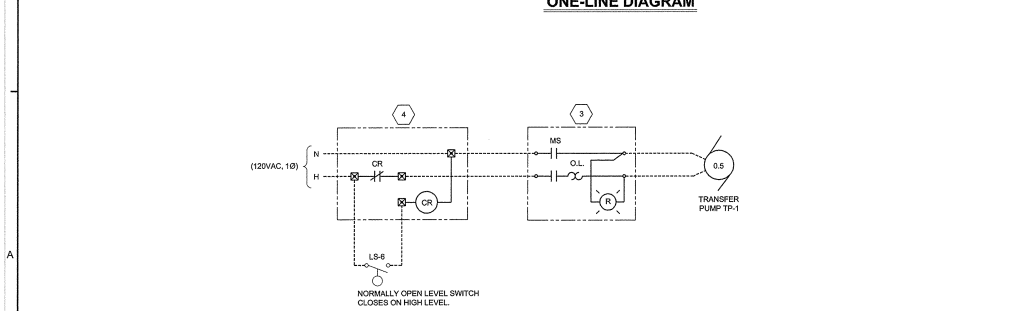
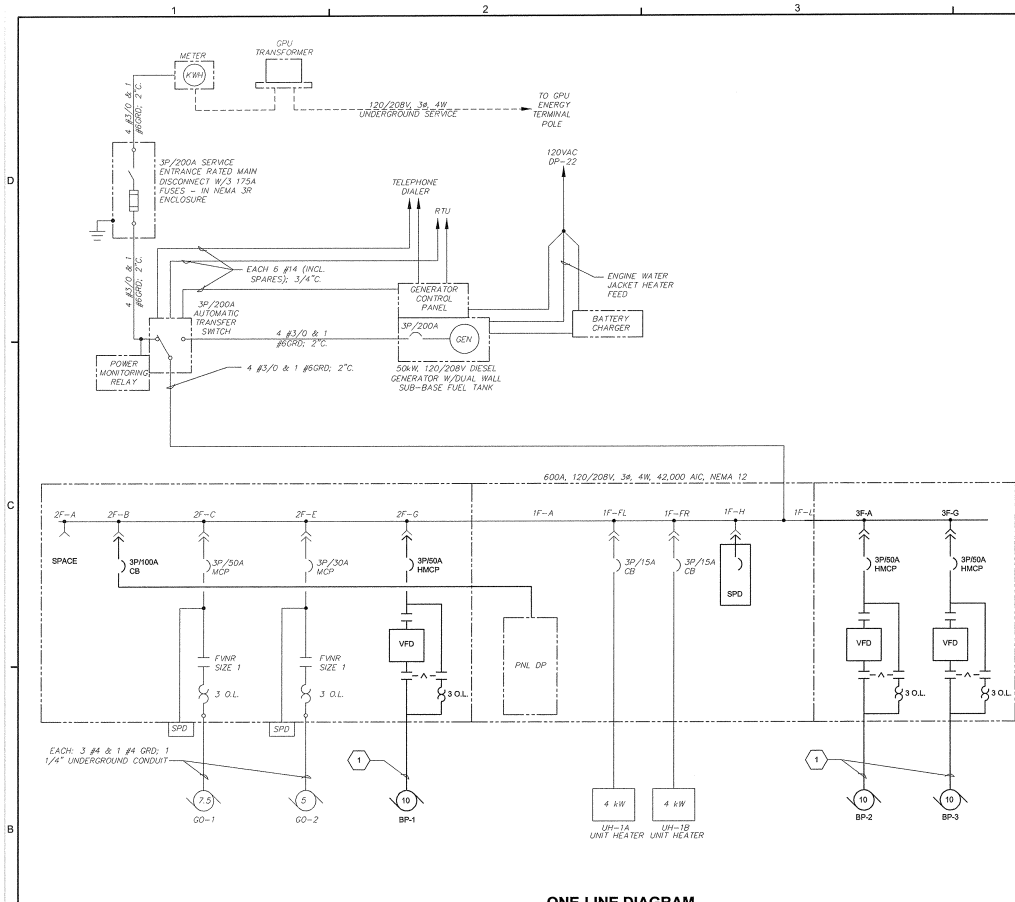
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NO.	DATE	REV.	BY	APP'D.
0	8/14/08		SMC	
1	11/16/07		SMC	
2	10/31/07		SMC	
3	10/30/07		SMC	
4	10/30/07		SMC	
5	10/30/07		SMC	

Pennsylvania
 American Water
 REGICOMMONOR TOWNSHIP, BERKS COUNTY, PENNSYLVANIA
GOLDEN OAKS WELL GO-3 AND FACILITY UPGRADES
 CIVIL / MECH
 GOLDEN OAKS WELL FACILITY PIPING PLAN, IMAGES & KEYED NOTES

SCALE: AS NOTED
 PREPARED BY: LYM
 CHECKED BY: JEB SMITH
 APPROVED BY: SMC
 PROJECT NO.: 8136.01
 DWGNO: 01

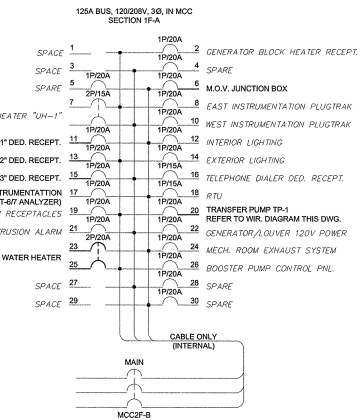


DRAWING NOTES

- REFER TO DRAWING CS-1 FOR GENERAL PROJECT NOTES, DRAWING INDEX AND DRAWING CONVENTIONS.
- REFER TO DRAWING CS-2 FOR DISCIPLINE SPECIFIC LEGENDS AND ABBREVIATIONS.

KEYED DRAWING NOTES

- USE HEAT-RESISTANT COPPER CABLE, #18 OR HIGHER. PROVIDE 3 #8 & 1 #6 GRD. 1" CONDUIT, THE EXISTING 1" CONDUIT INSTALLED BETWEEN MCC SECTION 1F AND PUMP PAD MAY BE REUSED FOR BP-1 OUTPUT POWER WIRING IF FOUND UNHARMED.
- DISCONNECT AND REMOVE EXISTING PANEL OF MAIN BREAKER BUCKET FROM SECTION 1F-H. RELOCATE 3P/150A CIRCUIT BREAKER AND BUCKET FROM MCC SPACE 1F-H TO MCC SPACE 2F-B. WIRE NEW (2F-B) BREAKER TO BUS OF PANEL DP.
- PROVIDE FRACTIONAL HP MANUAL MOTOR STARTER, TOGGLE SWITCH TYPE. 2-POLE WITH OVERLOAD AND PILOT LIGHT, NEMA 4 ENCLOSURE, AS MANUFACTURED BY SQUARE D COMPANY, CLASS 2510, MODEL FW9P, OR APPROVED EQUIVALENT.
- PROVIDE CONTINUOUS HINGE TYPE NEMA 4 ENCLOSURE, SIZED AS REQUIRED FOR INSTALLATION OF CONTROL RELAY AND TERMINAL BLOCKS, AS MANUFACTURED BY HOFFMAN ENGINEERS CO. TYPE CHNF, OR APPROVED EQUIVALENT. PROVIDE IEC TYPE INDUSTRIAL CONTROL RELAY, 120VAC, WITH ONE NO AND ONE NC CONTACT (10A CONTINUOUS AMPERES RATING MINIMUM, AS MANUFACTURED BY SQUARE D COMPANY, MODEL NO. CAGR11G7 OR APPROVED EQUIVALENT.



EXISTING PANEL "DP" SCHEDULE

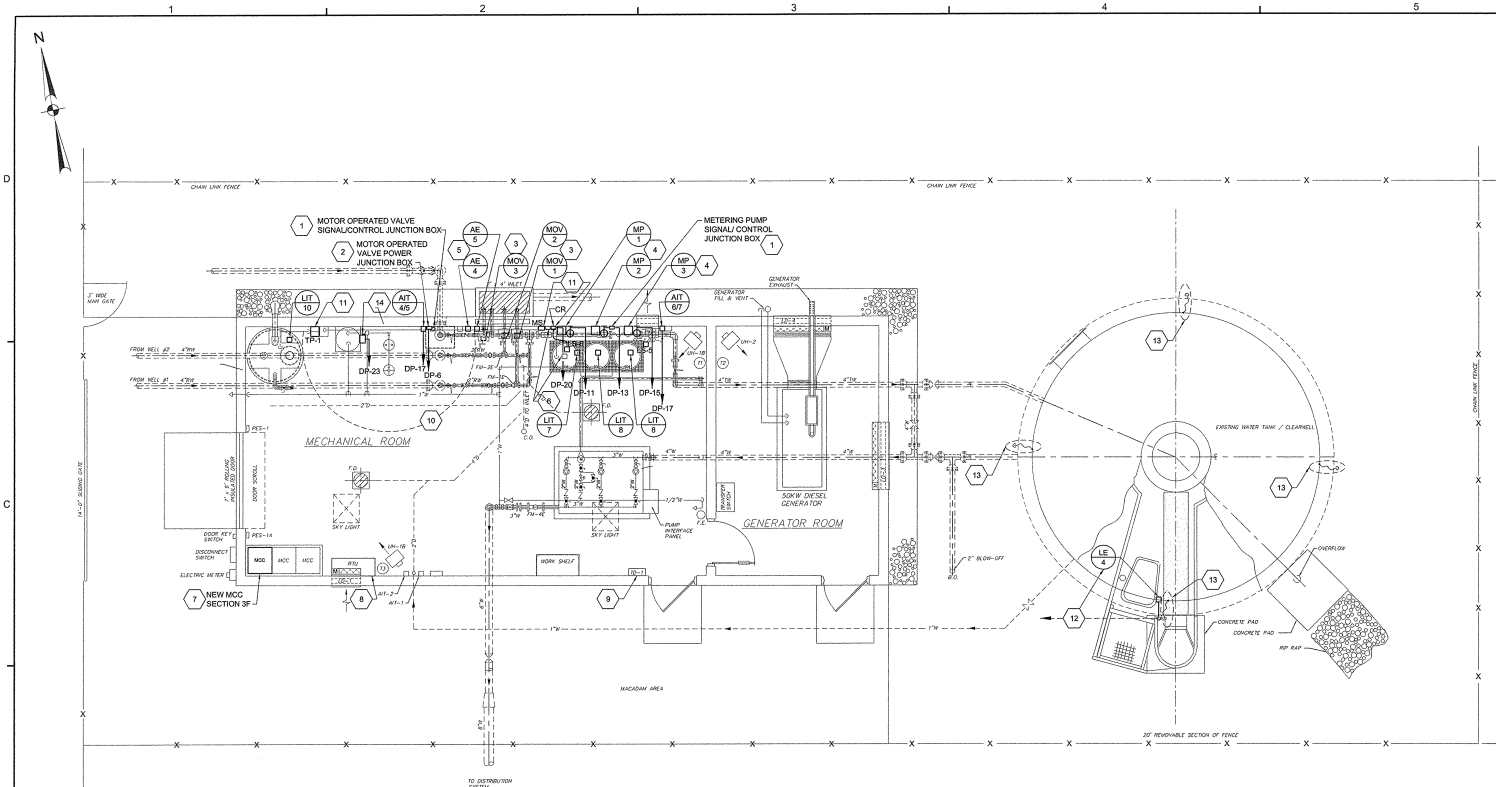
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DATE	BY	CHKD	APPD
	BS/BS	BS/BS	BS/BS
	11/18/07	BS/BS	BS/BS
	10/18/07	BS/BS	BS/BS
	03/07	BS/BS	BS/BS

Pennsylvania
 American Water
 BERKS COUNTY, PENNSYLVANIA
GOLDEN OAKS WELL GO-3 AND FACILITY UPGRADES
 ELECTRICAL
 WELL / PUMPING FACILITY - ONE LINE DIAGRAM, MCC VIEW & PANEL SCHEDULE

SCALE: NONE
 PREPARED BY: LMK
 CHECKED BY: LMK
 APPROVED BY: BS/BS
 PROJECT NO: E156-01
 DRAWING NO:

E-1



PLAN - GOLDEN OAKS WELL PUMPING FACILITY
 SCALE: 1" = 1'-0"
 0' 1' 2' 4' 8'

DRAWING NOTES

1. REFER TO DRAWING CS-1 FOR GENERAL PROJECT NOTES, DRAWING INDEX AND DRAWING CONVENTIONS
2. REFER TO DRAWING CS-2 FOR DISCIPLINE SPECIFIC LEGENDS AND ABBREVIATIONS.

KEYED DRAWING NOTES

- 1 PROVIDE 6" x 6" x 4" JUNCTION BOX, SUITABLY MOUNTED ON WALL. THIS AREA SIGNAL/CONTROL JUNCTION BOX SHALL BE CONNECTED TO EXISTING RTU ENCLOSURE VIA (1) 2 INCH CONDUIT.
- 2 PROVIDE 8" x 8" x 4" JUNCTION BOX, SUITABLY MOUNTED ON WALL. THIS AREA M.O.V. POWER JUNCTION BOX SHALL BE WIRED TO EXISTING DISTRIBUTION PANEL AS SHOWN.
- 3 MOTOR OPERATED VALVES SHALL BE POWERED FROM LOCAL POWER JUNCTION BOX. REFER TO KEYED DRAWING NOTE #2. VALVE CONTROL STATUS WIRING SHALL BE AS SHOWN ON DRAWING E-3 - AND SHALL BE ROUTED THROUGH LOCAL SIGNAL/CONTROL JUNCTION BOX. REFER TO KEYED DRAWING NOTE #1.
- 4 PROVIDE GROUNDED (NEEMA 3-20) 120VAC CORD AND PLUG SETS FOR (3) METERING PUMPS. METERING PUMPS SHALL BE POWERED FROM LOCAL DEDICATED RECEPTACLES AS SHOWN. CONTROL WIRING FOR METERING PUMPS SHALL BE (4) #14 & 3/4" SMC SEALTITE TO LOCAL SIGNAL/CONTROL JUNCTION BOX.
- 5 TURBIDITY PACKAGE WIRING SHALL BE AS SHOWN ON DRAWING E-3.
- 6 RELOCATE MIXER AND CONTROL ENCLOSURE FROM NORTHWEST CORNER OF PUMPING FACILITY TO NEW DRUM AS SHOWN. PLUG POWER CORD INTO LOCAL UTILITY RECEPTACLE.
- 7 PROVIDE COMPLETE NEW MCC SECTION, OUTFITTED AS SHOWN ON DRAWING E-1. NEW SECTION SHALL BE INSTALLED ON EXISTING CONCRETE PAD AS SHOWN, AND CONNECTED PER MANUFACTURERS REQUIREMENTS.
- 8 NEW WIRING ORIGINATING OR ENDING IN EXISTING RTU ENCLOSURE SHALL BE INSTALLED IN RACEWAY INTO ENCLOSURE. COORDINATE WITH OWNER FOR TERMINATION TO HIS NEW PLC EQUIPMENT. REFER TO DRAWING E-3. COORDINATE SCHEDULING WITH SYSTEM INTEGRATOR.
- 9 EXISTING DEALER SHALL REMAIN TO SERVE AS A SECURITY SYSTEM TERMINATION POINT, AND ACTIVATION/DEACTIVATION INPUT DEVICE. EXISTING INTRUSION ALARM WIRING BETWEEN DEALER AND RTU SHALL REMAIN, TO BE CONNECTED TO NEW EQUIPMENT BY SYSTEM INTEGRATOR.
- 10 A 6 FOOT RADIUS AROUND NEW EYEWASH FIXTURE IS SHOWN. ALL RECEPTACLES IN THIS AREA SHALL BE GFI IN WEATHERPROOF-WHALE-IN-USE RATED ENCLOSURES.
- 11 NEW TRANSFER PUMP SHALL BE PLACED ON WALL MOUNTED SHELF. REFER TO WIRING DIAGRAM AND KEYED NOTES 3 & 4 ON DRAWING E-1.
- 12 PROVIDE NEW LEVEL ELEMENT "LE-4", INSTALLED PER MANUFACTURERS INSTRUCTIONS. MODIFY AND EXTEND EXISTING CONDUIT RISER AS REQUIRED TO SUIT INCREASED HEIGHT OF EXTENDED TANK.
- 13 EXISTING CONNECTIONS TO GROUNDING CONDUCTORS SHALL REMAIN THROUGHOUT CONSTRUCTION. REPAIR OR REPLACE COMPONENTS AS REQUIRED TO MAINTAIN INTEGRITY OF GROUNDING SYSTEM FOR MODIFIED TANK.
- 14 PROVIDE LOCAL DISCONNECTING MEANS AS REQUIRED BY THE N.E.C. FOR WATER HEATING EQUIPMENT. WIRE NEW WATER HEATER BACK TO PANEL DP AS SHOWN.

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0	ISSUED FOR PERMITS				
1	ISSUED FOR SHOP DRAWING				
2	ISSUED FOR PRELIMINARY CLIENT REVIEW				
3	ISSUED FOR PRELIMINARY CLIENT REVIEW				
4	ISSUED FOR PERMITS				

NO.	REVISION	DATE	BY	CHK	APP'D
0	ISSUED FOR PERMITS				
1	ISSUED FOR SHOP DRAWING				
2	ISSUED FOR PRELIMINARY CLIENT REVIEW				
3	ISSUED FOR PRELIMINARY CLIENT REVIEW				
4	ISSUED FOR PERMITS				

Pennsylvania
 American Water
 RUSCOBANKOR TOWNSHIP, BERKS COUNTY, PENNSYLVANIA
GOLDEN OAKS WELL GO-3 AND FACILITY UPGRADES
 ELECTRICAL
 WELL / PUMPING FACILITY PLAN

SCALE:	AS NOTED
PREPARED BY:	YK
CHECKED BY:	
APPROVED BY:	
PROJECT NO.:	1918-01
DRAWING NO.:	

CONDENSED ELECTRICAL TECHNICAL SPECIFICATIONS

NOTE: THESE DRAWINGS AND SPECIFICATIONS WITH THE PROJECT MANUAL WITH APPENDICES, INSTRUCTION TO BIDDERS AND SCOPE OF WORK THAT WAS ISSUED IN 10' x 11' FORMAT AS AN ATTACHMENT TO THESE DRAWINGS, AND BE SO HONORED IN THE PREPARATION OF THE PROPOSAL AND EXECUTION OF THE CONTRACT. THE FOLLOWING SPECIFICATIONS ARE PROVIDED FOR THE MAJOR PIECES OF EQUIPMENT.

16.1 GENERAL DESCRIPTION

A. WARRANTY

1. THE CONTRACTOR SHALL UNCONDITIONALLY GUARANTEE IN WRITING, ALL WORK, ARTICLES, APPLIANCES, MATERIALS, EQUIPMENT, AND WORKMANSHIP FURNISHED, INSTALLED, OR SUPPLIED UNDER THIS CONTRACT FOR A PERIOD OF ONE YEAR FROM THE DATE OF ACCEPTANCE BY THE OWNER.
2. THE CONTRACTOR SHALL ADJUST, REPAIR, OR REPLACE ANY DEFECTIVE PART OF THE SYSTEM WITHOUT COST TO THE OWNER.

B. CODES AND STANDARDS

1. PROVIDE EQUIPMENT AND INSTALLATION IN ACCORDANCE WITH THIS SPECIFICATION AND APPLICABLE REQUIREMENTS OF THE FOLLOWING:
 - a. AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)
 - b. AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)
 - c. AMERICANS WITH DISABILITIES ACT PUBLIC LAW (101-398)
 - d. AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)
 - e. NATIONAL ELECTRICAL CODE (NEC)
 - f. OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA)
 - g. UNDERWRITERS LABORATORIES INC. (UL)
 - h. NATIONAL FIRE PROTECTION ASSOCIATION: NATIONAL FIRE CODES (NFPA)
 - i. INTERNATIONAL BUILDING CODE (IBC 2009)
 - j. PENNSYLVANIA DEPARTMENT OF LABOR AND INDUSTRY FIRE AND PANIC REGULATIONS
 - k. ALL LOCAL CODES AND ORDINANCES

2. THE CONTRACTOR SHALL OBTAIN ALL PERMITS, LICENSES, AND APPROVALS WITH THE PERMITS AGENCIES HAVING JURISDICTION, PAY ALL CHARGES AND FEES, FILE ALL NECESSARY PLANS, AND GIVE ALL NOTICES NECESSARY AND INCIDENT TO THE LAWFUL PROSECUTION OF THE WORK. THE CONTRACTOR SHALL OBTAIN AND FURNISH TO THE OWNER ALL CERTIFICATES FOR WORK WHICH CERTIFICATES ARE REQUIRED. THE CONTRACTOR SHALL PAY FOR ALL STATE, COUNTY, BOROUGH, AND TOWNSHIP FEES, PERMITS, LICENSES, LAWS, AND/OR OTHER FEES WHICH MAY BE REQUIRED IN THE PERFORMANCE OF HIS CONTRACT AND NOT OTHERWISE PROVIDED FOR.

16.2 DEMOLITION

1. REMOVE, RELOCATE, AND EXTEND EXISTING INSTALLATIONS TO ACCOMMODATE NEW CONSTRUCTION.
2. REMOVE COMBINATION STARTERS AND SURGE PROTECTION DEVICES AS SHOWN ON DRAWING D-2 AND RETURN TO THE OWNER. COORDINATE DEMOLITION WITH THE OWNER. EXISTING RUP AND RUMP STARTERS SHALL BE REPLACED ONE BY ONE ALLOWING THE BOOSTER PUMP STATION OPERATION DURING UPGRADE.
3. REMOVE ABANDONED WIRING TO THE SOURCE OF ITS SUPPLY.
4. REMOVE EXPOSED ABANDONED CONDUIT, INCLUDING ABANDONED CONDUIT ABOVE ACCESSIBLE CEILING FINISHES. CUT CONDUIT FLUSH WITH WALLS AND FLOORS, AND GROUT SHUT. PATCH ADJACENT SURFACES DISTURBED DURING CONSTRUCTION AND DEMOLITION.
5. REPAIR AND PATCH ADJACENT CONSTRUCTION AND FINISHES DAMAGED DURING DEMOLITION AND EXTENSION WORK.
6. MAINTAIN ACCESS TO EXISTING ELECTRICAL EQUIPMENT AND INSTALLATIONS WHICH ARE TO REMAIN ACTIVE DURING THE CONSTRUCTION PERIOD.

16.3 CONDUIT

1. GALVANIZED RIGID STEEL CONDUIT SHALL BE UNLTD STEEL, PIPING, HOT DIP GALVANIZED AFTER FABRICATION WITH A MINIMUM THICKNESS OF ZINC APPLIED TO THE INSIDE AND OUTSIDE SURFACES, IN COMPLIANCE WITH UL5. FITTINGS AND CONDUIT BOXES SHALL BE THE SAME TYPE TO MATCH CONDUIT. RIGID CONDUIT SHALL BE INSTALLED UNDERGROUND AND IN EXPOSED INDOOR AND OUTDOOR LOCATIONS.
2. LIQUID-TIGHT FLEXIBLE METAL CONDUIT SHALL BE FORMED FROM CONTINUOUS LENGTH OF SPIRALLY WOUND, INTERLOCKED ZINC-COATED STRIP STEEL AND COATED WITH A LIQUID-TIGHT JACKET OF FLEXIBLE POLY VINYL CHLORIDE (PVC). CONNECTORS SHALL BE LIQUID-TIGHT AND APPROVED FOR USE WITH LIQUID-TIGHT CONDUIT. LIQUID-TIGHT CONDUIT SHALL BE INSTALLED FOR FLAT CONNECTION TO EQUIPMENT AND INSTRUMENTATION.
3. MAINTAIN MINIMUM 12 INCH CLEARANCE BETWEEN CONDUIT AND HEAT SUPPORT RIGID METALLIC CONDUIT AT A MAXIMUM OF 10 FEET ON CENTER. SUPPORT FLEXIBLE METALLIC CONDUIT AND NON-METALLIC CONDUITS AT DISTANCES NOT EXCEEDING NEC RECOMMENDATIONS FOR SPECIFIC CONDUIT TYPES INSTALLED.
4. WHERE CONDUIT PENETRATES A WALL, THE PENETRATION SHALL BE SEALED WATER-TIGHT.

16.4 SUPPORT

1. QUALITY ASSURANCE: SUPPORT SYSTEMS SHALL BE ADEQUATE FOR WEIGHT OF EQUIPMENT AND CONDUIT, INCLUDING WIRING, WHICH THEY CARRY.
2. MATERIAL:
 - A. SUPPORT CHANNEL: GALVANIZED STEEL IN ACCORDANCE WITH ASTM A 486.
 - B. CORROSION RESISTANT IN ACCORDANCE WITH ASTM A 36
3. INSTALLATION:
 - A. FASTEN HANGER RODS, CONDUIT CLAMPS, AND OUTLET AND JUNCTION BOXES TO BUILDING STRUCTURE USING PRECAST INSERT SYSTEM EXPANSION ANCHORS, PRESET INSERTS, BEAM CLAMPS.
 - B. USE TOGGLE BOLTS OR HOLLOW WALL FASTENERS IN HOLLOW MASONRY, PLASTER, OR GYPSUM BOARD PARTITIONS AND WALLS; EXPANSION ANCHORS OR PRESET INSERTS IN SOLID MASONRY WALLS; SELF-DRILLING ANCHORS OR EXPANSION ANCHOR ON CONCRETE SURFACES; SHEET METAL SCREWS IN SHEET METAL STUDS; AND WOOD SCREWS IN WOOD CONSTRUCTION.
 - C. DO NOT FASTEN SUPPORTS TO PIPING, DUCTWORK, MECHANICAL EQUIPMENT, OR CONDUIT.
 - D. DO NOT USE POWDER-ACTUATED ANCHORS.
 - E. DO NOT DRILL STRUCTURAL STEEL MEMBERS.
 - F. FABRICATE SUPPORTS FROM STRUCTURAL STEEL OR STEEL CHANNEL, RIGIDLY WELDED OR BOLTED TO PRESENT A NEAT APPEARANCE. USE HEXAGON HEAD BOLTS WITH SPRING-LOCK WASHERS UNDER ALL NUTS.
 - G. PROVIDE SUPPORT AND REINFORCED CONCRETE PAD AS REQUIRED FOR INSTALLATION OF EXTERIOR ELECTRICAL EQUIPMENT FOR WELL GO-3 PUMP STATION AS SHOWN ON DRAWING E-4.

16.5 WIRE AND CABLE

1. BUILDING WIRE

- A. FEEDERS AND BRANCH CIRCUITS OTHER THAN RECEPTACLE CIRCUITS: COPPER, STRANDED CONDUCTOR, 600 VOLT INSULATION, TYPE THWN, COMPLYING WITH UL 8.
- B. CONTROL CIRCUITS, COPPER, STRANDED CONDUCTOR 900 VOLT INSULATION, TYPE THWN, COMPLYING WITH UL 8 INSIDE ENCLOSURE TYPE BS.
- C. ALL WIRING SHALL BE INSTALLED IN RACEWAY.

2. INSTRUMENTATION CABLE: SHIELDED CABLE FOR INSTRUMENTATION WIRING SHALL BE STRANDED COPPER PAIRS TWISTED TOGETHER HAVING A TINNED COPPER DRAIN WIRE AND OVERALL PVC JACKET. INSTRUMENTATION CABLEING SHALL BE OF THE SIZE AND TYPE RECOMMENDED BY THE SPECIFIC EQUIPMENT MANUFACTURERS, OR #18AWG STR. BULDEN #136. ALL INSTRUMENTATION CABLE SHALL BE RUN IN RIGID STEEL CONDUIT SEPARATE FROM ALL POWER OR CLASS 1 CONTROL CIRCUITS.

3. VFD CONTROL AND POWER CONDUCTORS: AS SPECIFIED BY SELECTED VFD MANUFACTURER.
4. WIRING CONNECTIONS AND TERMINATIONS
 - A. SPLICE ONLY IN ACCESSIBLE JUNCTION BOXES.
 - B. USE SOLDERLESS PRESSURE CONNECTORS WITH INSULATING COVERS FOR STRANDED TO STRANDED WIRE AND INSULATED SPRING WIRE CONNECTORS WITH PLASTIC CAPS FOR SOLID TO STRANDED AND SOLID TO SOLID COPPER WIRE SPLICES AND TAPS, NO. 8 AWG AND SMALLER.
 - C. USE INSULATED MULTI-CABLE CONNECTOR BLOCKS FOR COPPER WIRE SPLICES AND TAPS, NO. 8 AWG AND LARGER AS MANUFACTURED BY NSI, TYPE POLARIS, OR APPROVED EQUIVALENT.
 - D. TAPE UNINSULATED CONDUCTORS AND CONNECTORS WITH ELECTRICAL TAPE TO 150 PERCENT OF THE INSULATION VALUE OF THE CONDUCTOR.

5. WIRE/CABLE IDENTIFICATION
 - A. LABEL EACH WIRE AT ALL TERMINATION POINTS.
 - B. THE FOLLOWING COLOR CODING SHALL BE USED THROUGHOUT:

120/208V - 3 PHASE:
PHASE - BLACK
PHASE - RED
PHASE C - BLUE
NEUTRAL - WHITE
GROUND - GREEN
 - C. CABLE TESTING
 - A. ALL NEW CABLES, INCLUDING ALL TERMINATIONS SHALL BE TESTED AFTER INSTALLATION, AND PRIOR TO BEING ENERGIZED.
 - B. CABLE TEST SHALL CONSIST OF A CONDUCTOR CONTINUITY TEST FOR ALL CABLES 600 VOLTS AND BELOW.
 - C. TORQUE TEST ALL CONDUCTOR TERMINATIONS AND CONNECTIONS TO CABLE AND EQUIPMENT PER MANUFACTURERS SPECIFICATIONS.
 - D. CORRECT MALFUNCTIONING PRODUCTS AT SITE, WHERE POSSIBLE, AND RETEST TO DEMONSTRATE COMPLIANCE. OTHERWISE, REMOVE AND REPLACE WITH NEW AND RETEST.

16.6 UNDERGROUND ELECTRICAL WORK

1. DUCT, FITTINGS AND SPACERS SHALL BE NONMETALLIC TYPE HEAVY WALL RIGID PVC SCHEDULE 40 FOR ALL UNDERGROUND INSTALLATION UNLESS NOTED OTHERWISE.
2. INSTALL NONMETALLIC CONDUIT AND DUCT AS INDICATED ACCORDING TO MANUFACTURERS WRITTEN INSTRUCTIONS. BURIAL DEPTH MINIMUM 36 INCHES BELOW FINISHED GRADE.
3. A BRIGHTLY COLORED PLASTIC TAPE WITH SUITABLY INSCRIBED MESSAGE AT NOT MORE THAN 16-FOOT INTERVALS SHALL BE PLACED APPROXIMATELY 12 INCHES BELOW FINISHED GRADE LEVEL, AND ABOVE ELECTRICAL LINES. THE TAPE SHALL BE MANUFACTURED WITH INTEGRAL WIRES, FOL BACKING OR OTHER MEANS TO ENABLE DETECTION BY A METAL DETECTOR. THE TAPE SHALL BE ENCASED IN A PROTECTIVE JACKET TO PROTECT IT FROM CORROSION.

16.7 BOXES

1. PROVIDE ELECTRICAL BOXES AS REQUIRED FOR SPLICES, TAPS, EASE OF WIRE PULLING, EQUIPMENT CONNECTIONS, AND CODE COMPLIANCE, WHETHER OR NOT SPECIFICALLY SHOWN ON THE DRAWINGS. VERIFY AND COORDINATE THE LOCATION OF ALL BOXES AND OUTLETS WITH OTHER TRADES.
2. PULL AND JUNCTION BOXES IN EXISTING WELL FACILITY SHALL BE NEMA TYPE 12 GALVANIZED STEEL ENCLOSURE WITH SCREW COVER.
3. PROVIDE CAST METAL BOXES FOR OUTDOOR INSTALLATIONS, NEMA TYPE 4 WHICH ARE REQUIRED FOR THE ENVIRONMENT. FLAT-FLANGED, SURFACE-MOUNTED JUNCTION BOX, UL LISTED.

16.8 ELECTRICAL IDENTIFICATION

1. ALL WIRE AND CABLE SHALL BE MARKED. POWER CABLES SHALL BE COLOR CODED AS NOTED IN PARAGRAPH 16.5 - E.8. CONTROL AND INSTRUMENTATION WIRE SHALL BE NUMBERED AT BOTH ENDS.
2. ENGRAVED THREE-LAYER LAMINATED PLASTIC BLACK LETTERS ON A WHITE BACKGROUND.
3. PROVIDE NAMEPLATES TO IDENTIFY ALL ELECTRICAL DISTRIBUTION AND CONTROL EQUIPMENT, AND LOADS SERVED.
4. PROVIDE SELF-ADHESIVE WARNING LABELS, FACTORY PRINTED, MULTICOLORED, COMPLIANT FOR DISPLAY ON FRONT COVER, DOOR OR OTHER ACCESS TO EQUIPMENT, WARNING LABELS AND SIGNS SHALL INCLUDE THE FOLLOWING LEGENDS:
 - A. EACH NEW PANELBOARD OR INDUSTRIAL CONTROL PANEL: *WARNING: POTENTIAL ARC-FLASH HAZARDS EXIST WHILE WORKING ON THIS ENERGIZED EQUIPMENT*
 - B. WORKSPACE CLEARANCE: *WARNING: OSHA REGULATION - AREA IN FRONT OF ELECTRICAL EQUIPMENT MUST BE KEPT CLEAR FOR 42 INCHES*

16.9 MOTOR CONTROL CENTER

1. GENERAL:

- A. PROVIDE ADDITIONAL SECTION MATCHING THE EXISTING MOTOR CONTROL CENTER MANUFACTURED BY CUTLER-HAMMER, FREEDOM MCC MODEL 2100.
- B. HORIZONTAL BUS: 600 AMPERES
VERTICAL BUS: 300 AMPERES
- C. WIRING: NEMA CLASS 1, TYPE B, CONTROL COPPER WIRING.
- E. NEMA 12 ENCLOSURE.

2. TRANSIENT VOLTAGE SURGE SUPPRESSOR
3. VARIABLE FREQUENCY DRIVES (VFDs)
 - A. VFDs SHALL BE PROVIDED FOR PUMPS (8P1 THRU 8P3) WITH FOLLOWING MOTOR LOADS: EACH 19 HP
 - B. MANUFACTURER: CUTLER-HAMMER, MODEL CVS9000
 - C. THE VFD SHALL BE UL LISTED, SUITABLE FOR PUMP APPLICATION, VARIABLE TORQUE, AND RATED FOR 3 PHASE, 208 VOLT OPERATION.
 - D. THE VFD SHALL BE EQUIPPED WITH THE FOLLOWING FEATURES:
 - 1) INCOMING LINE TYPE IMC MOTOR CIRCUIT PROTECTOR
 - 2) INVERTER INPUT CONTACTOR
 - 3) OUTPUT CONTACTOR INTERLOCKED WITH BY-PASS CONTACTOR
 - 4) OVERLOAD RELAY FOR BYPASS
 - 5) LINE RELEASER
 - 6) EMF FILTER
 - 7) INPUT PHASE LOSS, INPUT OVERVOLTAGE AND LINE SURGE PROTECTION
 - 8) OUTPUT SHORT CIRCUIT, OUTPUT FAULT, AND OUTPUT PHASE PROTECTION
 - 9) OVERTEMPERATURE, DC OVERVOLTAGE, DRIVE AND MOTOR OVERLOAD PROTECTION
 - 10) DOOR-MOUNT SPOT PENTOMETER
 - 11) FACTORY INSTALLED AUXILIARY CONTACTS
 - 12) 4-ON-4 OFF SELECTOR SWITCH WITH ADDITIONAL CONTACTS FOR REMOTE STATUS INDICATION
 - 13) PILOT LIGHTS FOR POWER ON, FAULT, BYPASS, RUN
 - 14) STANDARD LAMPED TIME METER
 - 15) DOOR-MOUNT KEYPAD/STOP
 - 16) 4.0MA ISOLATED CONFIGURABLE SPEED MTR
 - 17) 4.0MA SPEED/REFERENCE OUTPUT
 - 18) DISCRETE FAULT ALARM OUTPUT
 - 19) DISCRETE DRIVE RUNNING OUTPUT

4. WIRING CONNECTIONS AND TERMINATIONS
 - A. SPLICE ONLY IN ACCESSIBLE JUNCTION BOXES.
 - B. USE SOLDERLESS PRESSURE CONNECTORS WITH INSULATING COVERS FOR STRANDED TO STRANDED WIRE AND INSULATED SPRING WIRE CONNECTORS WITH PLASTIC CAPS FOR SOLID TO STRANDED AND SOLID TO SOLID COPPER WIRE SPLICES AND TAPS, NO. 8 AWG AND SMALLER.
 - C. USE INSULATED MULTI-CABLE CONNECTOR BLOCKS FOR COPPER WIRE SPLICES AND TAPS, NO. 8 AWG AND LARGER AS MANUFACTURED BY NSI, TYPE POLARIS, OR APPROVED EQUIVALENT.
 - D. TAPE UNINSULATED CONDUCTORS AND CONNECTORS WITH ELECTRICAL TAPE TO 150 PERCENT OF THE INSULATION VALUE OF THE CONDUCTOR.

16.10 WIRING DEVICES

1. RECEPTACLES SHALL BE SPECIFICATION GRADE. THE FACE AND BACKBODY OF THE RECEPTACLE SHALL BE OF HIGH-IMPACT THERMOPLASTIC. THE CONTACTS SHALL BE TRIPLE WIRE, 1-SLOT, ONE-PIECE COPPER ALLOY DESIGN. THE RECEPTACLE SHALL INCLUDE A GREEN GROUND SCREW ATTACHED TO THE BODY OF THE RECEPTACLE. RECEPTACLES SHALL BE RATED 20-AMPERE, 125VAC, NEMA CONFIGURATION 2-20R, SIDE WIRED WITH AN IVORY FINISH.
2. GROUND FAULT CIRCUIT INTERRUPTER RECEPTACLES (GFCI) SHALL HAVE A NYLON FACE AND A THERMOPLASTIC BACKBODY. GFCI RECEPTACLES SHALL BE UL CLASS A WITH A SAMLLAMPERE, GROUND-FAULT TRIP LEVEL. GFCI RECEPTACLES SHALL BE RATED 20-AMPERE, 125V-AC, NEMA CONFIGURATION 2-20R, SIDE WIRED WITH AN IVORY FINISH.
3. GENERAL USE WALL PLATES SHALL BE TYPE 40D BRUNNED STAINLESS STEEL. THE PLATE SHALL BE OF A MODERN DESIGN WITH ROUNDED EDGES AND CORNERS.
4. ALL RECEPTACLES INSTALLED IN WET LOCATIONS, PROVIDED FOR USE WITH LIMITED RATED EQUIPMENT SHALL BE INSTALLED IN A *WHITE* WHILE IN USE. ENCLOSURE, THE ENCLOSURE SHALL BE UL LISTED FOR USE IN WET LOCATIONS WITH A PLUS CONNECTED.

16.12 ELECTRICAL SERVICE ENTRANCE FOR WELL GO-3 STATION

1. NEW ELECTRICAL SERVICE RATED AT 208 VOLTS, 100 AMPERS, 3 PHASE, 4 WIRE. APPLICATION FOR ELECTRICAL SERVICE WILL BE DONE BY OTHERS.
2. COORDINATE WITH OWNER TO EXTEND SERVICE LATER (BY DEVELOPER) TO NEW UTILITY-APPROVED METER BASE, AND PROVIDE GUIDANCE TO UTILITY COMPANY SPECIFICATIONS.
3. PROVIDE UL LISTED AND LABELED METER SOCKET MEETING METED REQUIREMENTS. THE UTILITY SHALL APPROVE METERING EQUIPMENT LOCATION. METER, LOCATED OUTDOORS, SHOULD BE PLACED SO THAT THE CENTER OF THE METER SOCKET WILL BE FIVE FEET ABOVE FINAL GRADE LEVEL.
4. ELECTRICAL INSPECTION CERTIFICATE: AFTER THE ELECTRICAL INSTALLATION IS COMPLETE OBTAIN A WRITTEN CERTIFICATE OF APPROVAL FROM A COMPETENT INSPECTION AGENCY AUTHORIZED TO PERFORM THIS SERVICE. THE CERTIFICATE MUST BE SATISFACTORY TO METED AND MUST CERTIFY THAT THE WIRING SYSTEM IS IN COMPLIANCE WITH ALL APPLICABLE ORDINANCES HAVING JURISDICTION.
5. SERVICE DISCONNECT SWITCH: NEMA 3R ENCLOSURE, MANUAL TRANSFER, DOUBLE THROW SAFETY SWITCH, CONTINUOUS DUTY, UL LISTED, LOAD MAKE/BREAK RATED, PROVIDE SERVICE GROUNDING KIT, PROVIDE 60 (6) FUSES: CLASS R, DUAL ELEMENT, CURRENT LIMITING, TIME DELAY, ONE TIME FUSE.

16.13 CONTROL PANEL FOR WELL GO-3

1. PROVIDE FREE STANDING STAINLESS STEEL ENCLOSURE WITH SWING PANEL, RTU RELATED ITEMS WILL BE PROVIDED BY OWNER AND INSTALLED BY OWNERS SCADA INTEGRATOR. COORDINATE WITH OWNER THE SPACE REQUIREMENTS REQUIRED FOR INSTALLATION OF ALL COMPONENTS WITHIN THE ENCLOSURE.
2. PROVIDE LOCK KEY /KEY-OPERATED HANDLE FOR THE ENCLOSURE. THE ENCLOSURE KEY AND SECURITY-OVERRIDE KEY (REFER TO KEYED NOTE 21 ON DRAWINGS E-4) SHALL BE MATCHING.
3. REFER TO DRAWING E-4 KEYED DRAWING NOTES FOR LIST OF ITEMS AND TO SUBMERSIBLE WELL PUMP GO-3 CONTROL PANEL WIRING DIAGRAM.
4. ALL ITEMS SHALL BE INSTALLED PER MANUFACTURERS WRITTEN INSTRUCTIONS.

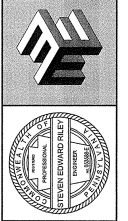
16.14 FIELD CHECK-OUT AND CALIBRATION

1. PROVIDE ALL LABOR, MATERIAL, AND EQUIPMENT NECESSARY TO FURNISH AND INSTALL A COMPLETE AND OPERABLE SYSTEM IN EACH LOCATION.
2. AFTER ELECTRICAL INSTALLATION IS COMPLETE, MAKE TESTS TO DEMONSTRATE THAT ENTIRE SYSTEM IS PROPERLY WIRING GROUND AND IN ACCORDANCE WITH DRAWINGS AND SPECIFICATIONS. MAKE NOT LESS THAN OUTLINED HEREAFTER, UNLESS REQUESTED IN WRITING AND APPROVED BY THE OWNER. TESTS ARE IN ADDITION TO AND NOT A SUBSTITUTION FOR TESTS OF INDIVIDUAL ITEMS.
3. PROVIDE A MINIMUM OF TWO DAYS START-UP AND TESTING ASSISTANCE, INCLUDING CALIBRATION, AS REQUIRED, FOR ALL ELECTRICALLY POWERED EQUIPMENT AND ELECTRONIC CONTROLS.
4. PAY ALL COSTS FOR TESTS, INCLUDING COSTS TO RETEST OCCASIONED BY DEFECTS AND FAILURES OF EQUIPMENT TO MEET SPECIFICATIONS.
5. CALIBRATION: FURNISH SUITABLE ELECTRICAL INSTRUMENTS, INCLUDING VOLTMETERS, AMPMETERS, WATTMETERS, TACHMETERS, AND ALL OTHER EQUIPMENT NECESSARY TO PERFORM TESTS SPECIFIED. MAKE NECESSARY CORRECTIONS IN CIRCUITS FOR TESTING INSTRUMENTS AND PLACE AND CONNECT ALL INSTRUMENTS, EQUIPMENT, AND DEVICES, NECESSARY FOR THE TESTS. UPON COMPLETION OF TESTS, REMOVE INSTRUMENTS AND INSTRUMENT CONNECTIONS AND RESTORE ALL CIRCUITS TO PERMANENT CONDITION, CONDUCT TESTS IN PRESENCE OF OWNER.
6. SYSTEM ACCEPTANCE
 - A. THE SYSTEM WILL NOT BE ACCEPTED UNTIL ALL EQUIPMENT SATISFIES THE ACCEPTANCE TEST REQUIREMENTS. THE COMPLETE SYSTEM SHALL OPERATE CONTINUOUSLY DURING AN ACCEPTANCE TEST PERIOD OF NOT LESS THAN THIRTY (30) DAYS WITH NO DOWN-TIME.
 7. TESTS:
 - A. INSULATION RESISTANCE TESTS OF CIRCUITS, 800 VOLTS AND BELOW:
 - 1) DO NOT SUBJECT CONDUCTORS RATED 600 VOLTS AND BELOW TO HIGH POTENTIAL DIELECTRIC TESTS. TEST COMPLETE FEEDER AND BRANCH CIRCUIT OF 800 VOLTS OR BELOW WITH EVERYTHING BUT POWER SUPPLY AND POWER-CONSUMING EQUIPMENT, CONNECTED THERETO.
 - 2) DETERMINE INSULATION RESISTANCE VALUES WITH ALL SWITCHES AND OVERCURRENT DEVICES IN PLACE.
 - 3) USE MEGOHMMETER HAVING OUTPUT OF AT LEAST 500 VOLTS TO DETERMINE INSULATION RESISTANCE VALUE FOR 800 VOLT RATED CONDUCTORS.
 - 4) ALL CABLES FAILING INSULATION TEST SHALL BE REMOVED, REPLACED, AND RE-TESTED.
 - 5) WHERE TESTS OF ANY OF THE ABOVE-REFERENCED EQUIPMENT ARE REQUIRED IN OTHER SECTIONS OF SPECIFICATIONS, COORDINATE TESTING, AS DIRECTED BY OWNER, TO AVOID DUPLICATION AND CONFLICT BETWEEN TESTS.
 - 6) PERFORM ABOVE TESTS IN ADDITION TO, AND NOT IN SUBSTITUTION FOR REQUIRED MANUFACTURERS FACTORY TESTS.
 - B. OPERATING TESTS:
 - 1) OPERATE MOTOR AND ASSOCIATED EQUIPMENT UNDER NORMAL OPERATING CONDITIONS FOR A SUFFICIENT LENGTH OF TIME TO DEMONSTRATE CORRECT ALIGNMENT, TEMPERATURE RISE, SPEED, AND SATISFACTORY OPERATION. LOAD MOTORS TO FULL CAPACITY, OR AS NEAR AS POSSIBLE.
 - 2) OPERATE CIRCUIT BREAKERS AND CONTROL DEVICES TO SHOW CORRECT AND SATISFACTORY OPERATION.
 - 3) WHERE TESTS OF ANY OF THE ABOVE-REFERENCED EQUIPMENT ARE INCLUDED IN OTHER SECTIONS OF SPECIFICATIONS, COORDINATE TESTING, AS DIRECTED BY OWNER, TO AVOID DUPLICATION AND CONFLICT BETWEEN TESTS.

DRAWING NOTES

1. REFER TO DRAWING GS-1 FOR GENERAL PROJECT NOTES, DRAWING INDEX AND DRAWING CONVENTIONS.
2. REFER TO DRAWING CS-2 FOR DISCIPLINE SPECIFIC LEGENDS AND ABBREVIATIONS.

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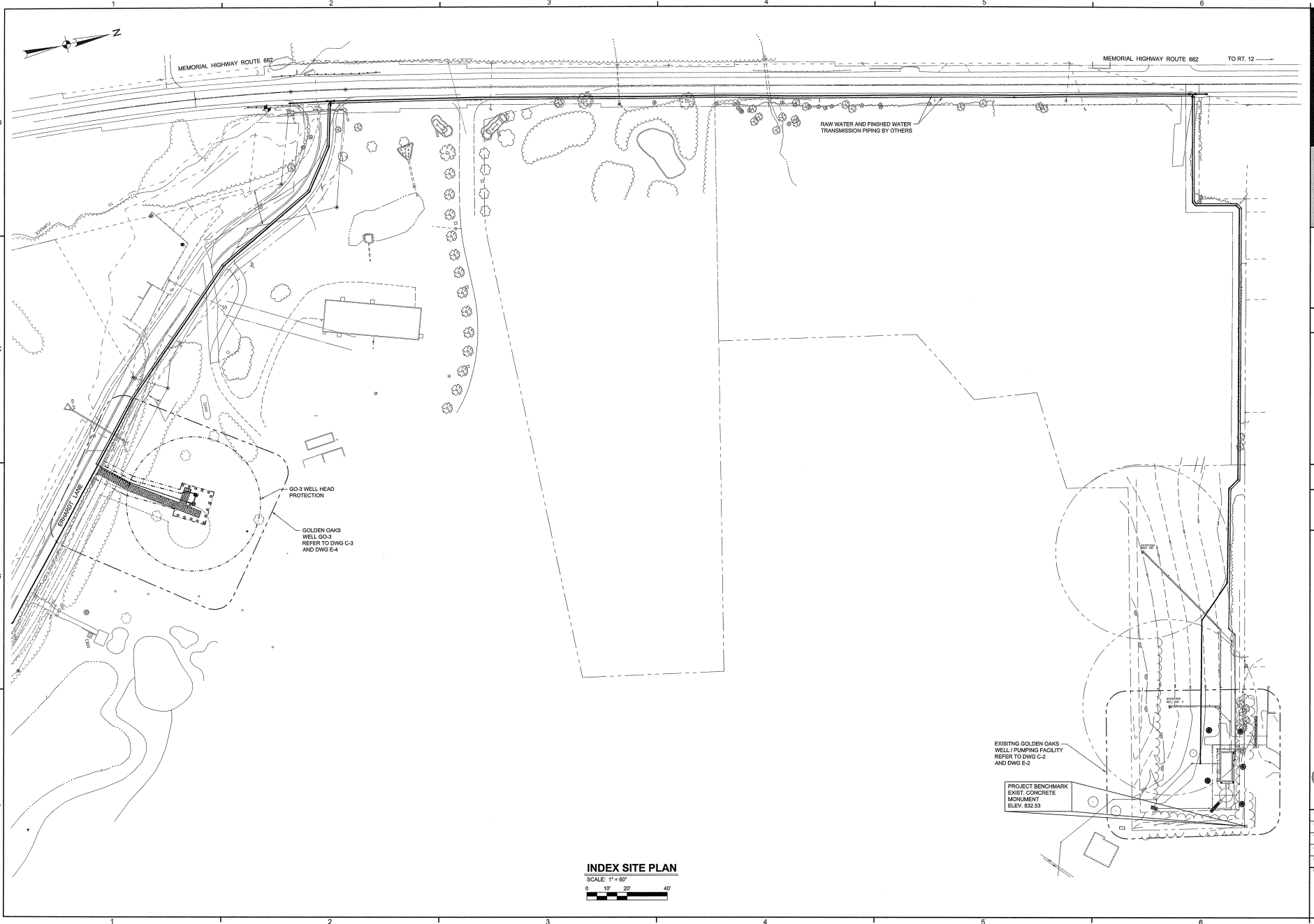


	BMC	BMC	BMC	BMC	PHD
DESIGNED BY					
CHECKED BY					
ISSUED FOR BIDDING					
ISSUED FOR PERMIT					
ISSUED FOR PRELIMINARY CLIENT REVIEW					
ISSUED FOR PRELIMINARY CLIENT REVIEW					
REV.					

Pennsylvania
American Water
RISCOVERAOK TOWNSHIP, BERKS COUNTY, PENNSYLVANIA
GOLDEN WELL GO-3 AND FACILITY UPGRADES
ELECTRICAL
CONDENSED ELECTRICAL SPECIFICATIONS

SCALE	AS NOTED
PREPARED BY	SBC
CHECKED BY	SBC
APPROVED BY	SBC
PROJECT NO.	E-5
DRAWN BY	

E-5



INDEX SITE PLAN

SCALE: 1" = 60'
 0 10 20 40'

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STEVEN EDWARD BAILEY
 PROFESSIONAL ENGINEER
 CIVIL ENGINEERING

DATE	REV.	DESCRIPTION
08/08/08	0	ISSUED FOR BIDDING
11/16/07	C	ISSUED FOR DEP PERMIT
10/01/07	B	ISSUED FOR PRE-FINAL PAW / CLIENT REVIEW
03/07/07	A	ISSUED FOR PRELIMINARY CLIENT REVIEW
		ISSUED FOR REVISED

Pennsylvania American Water
 DISCOMBMANOR TOWNSHIP, BERKS COUNTY, PENNSYLVANIA
GOLDEN OAKS WELL GO-3 AND FACILITY UPGRADES
 CIVIL, MECHANICAL & ELECTRICAL
 INDEX SITE PLAN

SCALE: AS NOTED
 PREPARED BY: DYH
 CHECKED BY: JPOWERSMITH
 APPROVED BY: SMC
 PROJECT NO.: 8136.01
 DRAWING NO.: I-1

DRAWING INDEX

<u>DRAWING NO.</u>	<u>DISCIPLINE</u>	<u>DESCRIPTION</u>
CS-1	CIVIL / MECH & ELECT	COVER SHEET, DRAWING INDEX & PROJECT NOTES
CS-2	CIVIL / MECH & ELECT	DISCIPLINE SPECIFIC LEGENDS
I-1	CIVIL / MECH & ELECT	INDEX SITE PLAN
<u>DEMOLITION</u>		
D-1	CIVIL / MECH	GOLDEN OAKS WELL FACILITY PIPING PLAN, IMAGES & KEYED NOTES
D-2	ELECTRICAL	DEMOLITION WELL / PUMPING FACILITY
<u>CIVIL \ MECHANICAL</u>		
C-1	CIVIL / MECH	PROCESS & INSTRUMENTATION, CHEMICAL FLOW & SCADA DIAGRAMS
C-2	CIVIL	GOLDEN OAKS PUMPING FACILITY SITE PIPING PLAN
C-3	CIVIL / MECH	WELL GO-3 SITE, ENLARGED PLANS & DETAILS
C-4	CIVIL / MECH	CONSTRUCTION DETAILS
C-5	CIVIL / MECH	WELL / PUMPING FACILITY PIPING PLAN, SECTIONS AND DETAILS
C-6	CIVIL / MECH	EQUIPMENT SCHEDULES, SECTIONS AND DETAILS
C-7	CIVIL / MECH	EXISTING CLEARWELL TANK PLAN, SECTIONS & DETAILS
C-8	CIVIL / MECH	GENERAL / MECHANICAL TECHNICAL SPECIFICATIONS
C-9	CIVIL / MECH	GENERAL / MECHANICAL TECHNICAL SPECIFICATIONS
<u>ELECTRICAL</u>		
E-1	ELECTRICAL	WELL / PUMPING FACILITY - ONE LINE DIAGRAM, MCC VIEW & PANEL SCHEDULE
E-2	ELECTRICAL	WELL / PUMPING FACILITY PLAN
E-3	ELECTRICAL	WELL / PUMPING FACILITY WIRING DIAGRAMS
E-4	ELECTRICAL	WELL GO-3 SITE PLAN, PANEL WIRING DIAGRAM & DETAILS
E-5	ELECTRICAL	CONDENSED ELECTRICAL SPECIFICATIONS