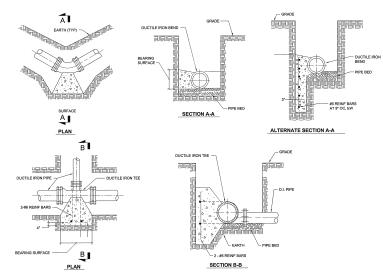


PIPE SIZE			5" AND 8"		1	10" AN	D 12°		1	14" AND 16"		
DEGREE BEND OR DEFLECTION		1 1/4*	22 1/2*	45*	11 1/4	22 1	12*	45*	11 1/4*	22 1/2°	45°	
LENGTH		3.00	4.00	6.00	4.50	6.0	0	8.00	6.00	8.00	11.00	
WIDTH		3.00	3.00	3.00	3.00	3.0	0	4.00	3,50	3.50	5.00	
DEPTH		2.00	3.00	4.00	3.00	4.9	0	5.00	3.50	5.00	5.00	
SQ. IN. REINFORCIP	iG	0.17	0.33	0.65	0.37	0.7	4	1.46	0.66	1.32	2.00	
BAR NO.	5	6	7	8	9	10	11	٦				
CROSS-SECTION IN.º PER BAR	0.31	0.44	0.60	0.79	1.00	1.27	1.50					
VERTICAL EMBEDMENT	15*	19"	26*	35"	44"	56"	68*					

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

	CKING AND	VERTICAL			ONTAL TH				
PIPE SIZES 👄		6" AND	18"			10" AND 12"			
TYPE OF REARING MATERIAL	DEGREE	BEND OR	DEFLECT		DEGREE	BEND OR	DEFLECT		
AND ALLOWABLE LOADS	11 1/4°	22 1/2 °	45 °	90°	11 1/4	22 1/2 0	45 °	90°	
SAND 1 TONISQ FT SOFT CLAY 1 TONISQ FT	1.50	3.00	6.00	12.00	3.00	6.00	12.00	24.50	
SAND & GRAVEL 2 TONISO FT	1.00	1.50	3.00	6.00	1.50	3.00	6.00	12.00	
CLAY 3 TONISQ FT	1.00	1.00	2.00	4.00	1.00	2.00	4.00	8.00	
SOFT ROCK 5 TONISO FT	1.00	1.00	1,00	2.50	1.00	1.00	2.50	5.00	
ROCK 20 TONISQ 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									
						RUST			
			THRUSTS			RUST 18" AN	0.20"		
BLO•	DKING AND	VERTICAL.	THRUSTS	DOWNWO	NRD				
BLO	DKING AND	VERTICAL	THRUSTS	DOWNWO	NRD	18° AN		10N 95°	
PIPE SIZES ** TYPE OF BEARING MATERIAL	DEGREE	14" AND	THRUSTS	TON	DEGREE	10" AM BEND OR	DEFLECT		
PIPE SIZES TYPE OF BEARING MATERIAL AND ALLOWINGLE LOADS SAND 1 TONING PT SIGHT CLAY 1 TONING PT	DEGREE	14° AND I BEND OR	16" DEFLECT	ION 80°	DEGREE	16" AN BEND OR 22 1/2 °	OEFLECT 45°	90°	
PIPE SIZES TYPE OF BEARING MATERIAL AND ALLOWINGLE LOADS SAND 1 TONING PT SIGHT CLAY 1 TONING PT	DEGREE	14" AND E BEND OR 22 1/2 "	16° DEFLECT 45° 21.50	10N 80° 43.00	DEGREE 11 1/4°	18" ANI BEND OR 22 1/2 "	45 °	90° 66.00	
PIPE SIZES TYPE OF BEARING MATERIAL, AND ALLOWABLE LOADS SAND 1 TONING PT SOFT CLAY 1 TONING PT SAND 8 GRAVEL 2 TONING PT.	DEGREE 11 1/4° 5.50 2.50	14" AND 1 BEND OR 22 1/2 0 11.00 5.50	16° 0EFLECT 45° 21.50 11.00	10N 90° 43.00 21.50	DEGREE 11 1/4 8.50 4.00	16" AN BEND OR 22 1/2 " 16.50 8.50	45 ° 33.00 16.50	90° 66.00 33.00	

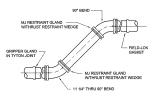
THRUST BLOCKING SCHEDULE OF DIMENSIONS



THRUST BLOCKING DETAIL

NOTES:

- 2. ALL REINFORCING STEEL SHALL BE DEFORMED BARS.
- INSTALL CONCRETE THRUST BLOCKS AT EACH ELBOW, TEE AND CAPPED OR VALVED END FITTINGS LOCATED IN THE HORIZONTAL PLANE.
- PAINT ALL EXPOSED STEEL WITH TWO COATS OF ASPHALT PAINT.
 NO COUPLING OR JOINTS SHALL BE COVERED WITH CONCRETE.
- 6. ALL-THREADS WITH PIPE STRAPS MAY BE USED IN PLACE OF REINFORCING BARS.
- ALL THRUST BLOCKS SHOWN ARE INTENDED AS A GUIDE AND SHALL WITHSTAND THE REQUIRED PRESSURE.
- 8. RETAINER GLANDS REQUIRED ON ALL MECHANICAL JOINT FITTINGS.
- CERTAIN SITUATIONS MAY WARRENT THE USE OF TIE RODS, AUTHORIZED BY THE WATER COMPANY ONLY.
- 10. PIPING SHALL BE WRAPPED WITH POLYETHYLENE PRIOR TO PLACEMENT OF CONCRETE.



TYPICAL THRUST RESTRAINT DETAIL

	LENGTH	OF PIF	E RE	QUIRE	ED (LF)	
				TYPE O	FITTING	
PIPE SIZE	11 1/4*	22 1/2*	45*	90°	TEE	CAPIVALVE
4-INCH	1	2	7	24	24	24
6-INCH	4	7	15	36	36	36
8-INCH	5	9	19	47	47	47

- 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

- 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.





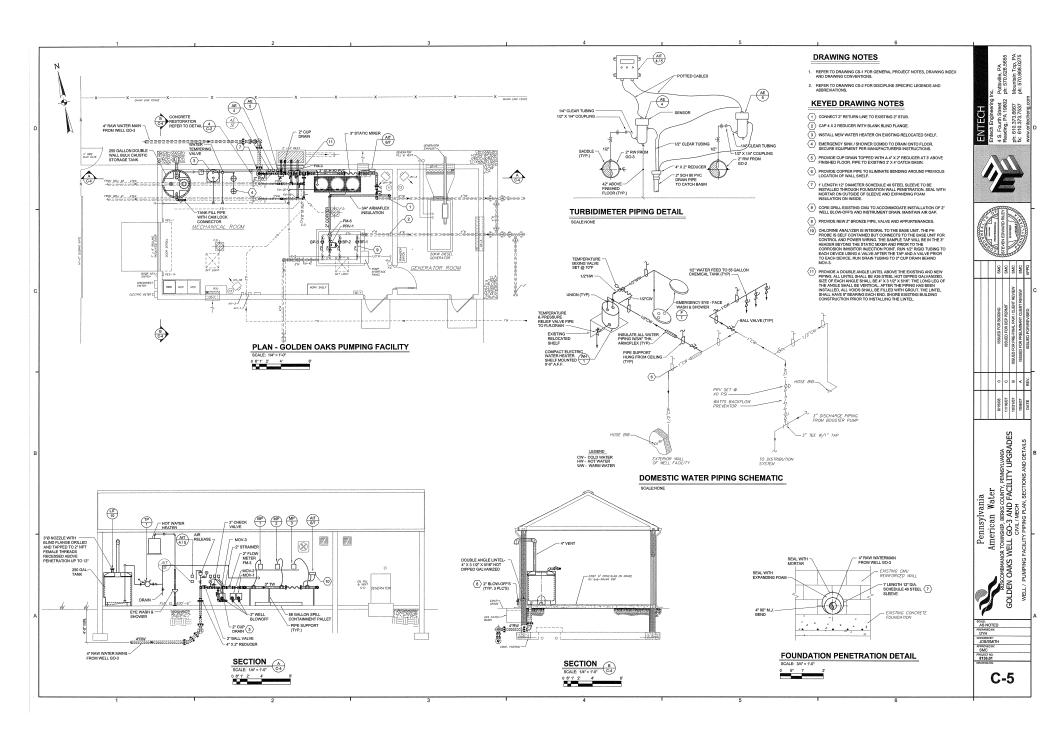


	~	202	zz	111			ı
		SMC	SMC	SMC	SMC	0ddV	
		ISSUED FOR BIDDING	ISSUED FOR DEP PERMIT	ISSUED FOR PRE-FINAL PAW / CLIENT REVIEW	ISSUED FOR PRELIMINARY CLIENT REVIEW	ISSUED FOR/REVISED	
		0	o	8	٧	REV.	
		9/15/08	11/16/07	10/31/07	10/8/07	DATE	

Pennsylvania
American Water
Societano Township, Renschwan
IN OAKS WELL GO-3 AND FACILITY UPGRADI
CONSTRUCTION DETAILS DETAILS

AS NOTED PREPARED BY
DYH
CHECKED BY
JDB
APPROVED BY
SMC
PROJECT NO.
8136.01

C-4



ELECTRIC OPERATED FLOW CONTROL VALVES ELECT. MOTOR OPERATION BASIS OF DESIGN REMARKS ITEM NO. SERVICE VALVE TYPE TYPE OF CONTROL FLOW (GPM) | SIZE | VALVE BASIS OF DESIGN | MIN | MAX | (IN) | MANUFACTURER | MODEL | F.L.A. | L.R.A. | VOLTAGE | MANUFACTURER | MODEL | MANUFACTURER | MANUFACTURER | MODEL | MANUFACTURER | MANUFACTURER | MODEL | MODE

SUBMERSIBLE PUMP SCHEDULE													
NO.	SERVICE	FLOW (GPM)		MOTOR H.P.	RPM	CONNEC	FLG OUTLET	VOLTAGE	BASIS OF DE	MODEL SIZE	STAGES		PUMP SHUT OFF FEET / PSI
GO-3	WELL WATER	50	238	5	3450	2*	4"	208-3-60	AERMOTOR	A+SS50-500	15	258FT	440/190

	BOOSTER PUMP SCHEDULE											
ITEM		FLOW	TDH	PUMP SHUT OFF	CONNECTIONS			HP RPM	VOLTAGE	BASIS OF DESIGN		
NO.	SERVICE	(GPM)	(FT.)	(FEET / PSI)	INLET	OUTLET	HP	RPM	VOLTAGE	MANUFACTURER	MODEL. SIZE	NOTES
BP-1	FINISHED WATER	90	300	394/170	2*	2*	10	3470	208-3-60	GRUNDFOS	CR15-6(E)	(1)
BP-2	FINISHED WATER	90	300	394/170	2*	2*	10	3470	208-3-60	GRUNDFOS	CR15-6(E)	(1)
BP-3	FINISHED WATER	90	300	394/170	2*	2*	10	3470	208-3-60	GRUNDFOS	CR15-6(E)	(1)

NOTES: (1) EXISTIND PUMPS WILL BE REMOVED AND NEW PUMPS RETROFITED TO THE PRE-ANCAGE SKID. REFER TO SPECIFICATIONS AND DETAILS FOR PURTHER INSTRUCTION. CONTRACTOR TO PROVIDE POWER AND CONTROL WIRE AND TO ACCOMDON'E IN

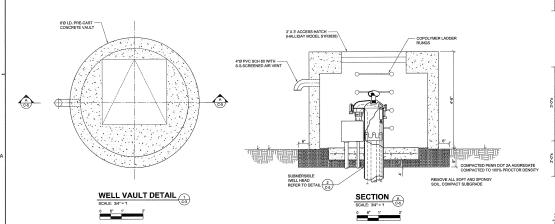
					CHEMICAL PUI	MPS					
ITEM		MIN FLOW	EST. FLOW	MAX FLOW	SYSTEM BACK	YSTEM BACK CONNECTIONS		VOLTAGE	BASIS OF DESIGN		NOTES
NO.	SERVICE	(GPH)	(GPH) (3)	(GPH)	PRESSURE - PSI (1)	INLET	OUTLET	VOLIMOE	MANUFACTURER	SERIES	NOTES
MP-1	CORROSION INHIBITOR	0.001	0.011	0.42	5	1/4" (O.D.)	1/4* (O.D.)	115-1-60	LMI	AA971-450SI	(2)
MP-2	CAUSTIC SODA (25%)	0.002	0.31	1.00	5	3/8" (O.D.)	3/8* (O.D.)	115-1-60	LMI	AA951-490SI	(2)
MP-3	SODIUM HYPOCHLORITE	0.001	0.043	0.42	5	1/4" (O.D.)	1/4" (O.D.)	115-1-60	LMI	AA971-450HI	(2)
TP-1	CAUSTIC SODA	0	800	900	6	1 1/2" (O.D.)	1 1/2" (O.D.)	115-1-60	VANTON	90	-

NOTES: (1) NOT INCLUDING BACK PRESSURE VALVES.
(2) PROVIDED WITH (9) FUNCTION VALVE. INSTALL ON EXISTING RELOCATED WALL MOUNTED SHELF AND PROVIDE ONE SPARE METERING PUMP FOR EACH CHEMICAL.
(3) STRIMATED DOSAGE AT WAR KAW WITH A FLOW

	ELECTRONIC INSTRUMENTATION SCHEDULE										
ITEM	DESCRIPTION	VOLTAGE	RANGE	OUTPUT	MANUFACTURER	MODEL	SIZE	REMARKS			
LE-3	WELL LEVEL WISSENSOR	24 VDC	0-230 FT	4-20 MA	DRUCK	PTX1230	.69°Ø	W/300 FT OF CABLE			
LE-4	TANK LEVEL SENSOR	24 VDC	0-25 FT	4-20 MA	DRUCK	PTX1230	.69"Ø	W/175 FT OF CABLE (2)			
FM-3	RAW WATER FLOW METER	24 VDC	4-200 GPM	4-20 MA	SCHLUMBERGER/NEPTUNE	HP TURBINE	2*	W/ TRICON-E TRANSMITTER			
FM-5	RECIRCULATION FLOW METER	NONE	4-200 GPM	NONE	SCHLUMBERGER/NEPTUNE	HP TURBINE	2*	-			
AIT-4 8 5	TURBIDITY METER / PROBE / CONTROLLER	120 VAC	0.001 - 10 NTU	4-20 MA	HACH	1720E-SC100	(3)	(4)			
LS-5	CONTAINMENT PALLET SWITCH	NONE		OPEN/CLOSE	W.E. ANDERSON	L-8	-	SPILL CONTAINMENT PALLET			
1.5-6	DAY TANK SWITCH	NONE		OPEN/CLOSE	W.E. ANDERSON	F7-882	-	CAUSTIC DAY TANK			
LIT-7,8,9,10	ULTRA SONIC LEVEL INDICATOR / TRANSMITTER	24 VDC	0-6 FT	4-20 MA	DREXELBROOK	USONIC	-				
AIT 6 &7	CL2 & pH ANALYZER	120 VAC	CL2 0-2 MG/L nH 4-10	TWO 4-20 MA	WALLACE & TIERNAN	DEPLOX 3 W/	-	W/ TWO AO CONNECTIONS			

NOTES: (1) CONNECT TO SECURITY INPUT BOARD IN RTURDIALER
(2) PROVIDE A SECOND SPARE TRANSMITTER AND FOWARD TO OWNER

(3) 1/4" INILET AND 1/2" OUTLET (4) ONE INSTRUMENT CONTROL REQUIRED FOR TWO TURBIDITY METERS SUPPLIED WITH 6" CABLE (PROBE TO CONTROLLER)

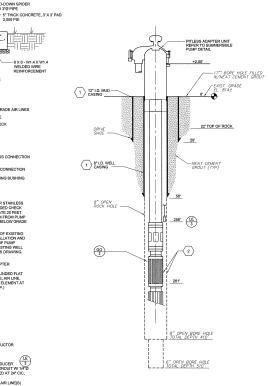


DRAWING NOTES

- REFER TO DRAWING CS-2 FOR DISCIPLINE SPECIFIC LEGENDS AND ABBREVIATIONS.

KEYED DRAWING NOTES

- REMOVE EXISTING TEMPORARY WELL CAP, SECTION OF WELL CASING AND MUD CASING, PROVIDE A 10° X 8° SCHEDULE 40 STEEL BUTT WELDED REDUCER TO ACCOMODATE INSTALLATION OF PITLESS ADAPTOR
- 2 DISINFECT WELL AND SUBMERSIBLE WELL PUMP IN STRICT ACCORDANCE WITH AWWA-C-654



EXISTING WELL GO-3 PROFLE

AS NOTED
PREPARED BY:
DYH
CHECKED BY:
JDB/SMITH
APPROVIDED: SMC PROJECT NO. 8136.01

SUBMERSIBLE WELL DETAIL (2) (C-3)

WELL CAP NOTE: WELL VAULT NOT SHOWN FOR CLARITY.

(2) 1/4" NYLOBRADE AIR LINES

-81Ø LD. PITLESS CONNECTION

4" DROP PIPE CONNECTION ----4" X 2" REDUCING BUSHING

DOUBLE DOOR STAINLESS STEEL THREADED CHECK VALVES LOCATE FROM THE

FOR DETAILS OF EXISTING CASING INSTALLATION AND PLACEMENT OF PUMP REFER TO EXISTING WELL PROFILES THIS DRAWING.

SECURE GROUNDED FLAT POWER CABLE, AIR LINE, AND SENSING ELEMENT AT 20'-0" O.C. (TYP.)

LEVEL TRANSDUCER

IN 34° PVC CONDUIT W 14°
HOLES DRILLED AT 24° CIC,
STAGGERED,
TWO (2) TEST AIR LINE(S)
TERMINATE APPROX. 6°
ABOVE 1ST STAGE BOWL
PUMP INTAKE SCREEN

SUBMERSIBLE PUMP MOTOR REFER TO PUMP SCHEDULE ON THIS DWG.

- POWER CABLE

INTEGRAL CHECK VALVES (2)

TOP OF PIPE

4" FLG'D DISCHARGE OUTLET W/STN STL BOLTS

CABLE/CONDUIT SEAL

2" SCH. 40 GALVANIZED DROP PIPE

LEVEL SENSOR MOUNTING BRACKET HOLD-DOWN SPIDER WITH 3"Ø PIPE

4 S. Fourth Street F Reading, PA 19602 pph: 610.373.6667 Nf: 610.373.7537 pwww.entecheng.com

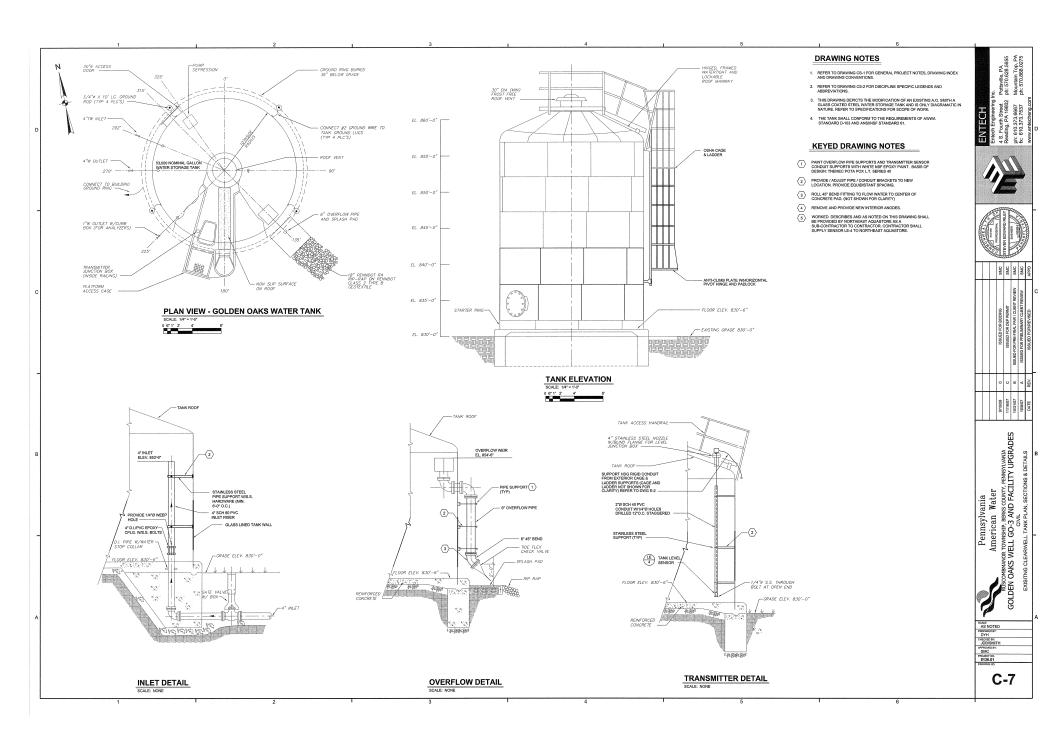




MLVANIA UPGRADES

RUSCOMBNANOR TOWNSHIP, BERKS COUNTY, PENNSS
GOLDEN OAKS WELL GO-3 AND FACILITY
COVIL/MECH
EQUIPMENT SCHEDULES, SECTIONS AND DETX Pennsylvania American Water

C-6



NOTE: WORK THESE BANKES MEDISCIPEATIONS WITH THE PROLECT THANKING WITH APPENDICES INSTRUCTION TO BIODESS AND SOFT OF MORNING THANKING WITH APPENDICES INSTRUCTION TO BIODESS AND SOFT OF MORNINGS AND SEE ON HOMEOSE IN THE PREPARATION OF THE PROPOSAL AND SECURION OF THE CONTRACT. THE FOLLOWING SPECIFICATIONS ARE PROVIDED FOR THE MANCH PREESS OF FOLIORITHE, TREPS TO THE MORNINGS ON THE DOWNINGS FOR MANUFACTURERS NAME AND MOCH, HUMBERS FOR AUDITIONAL MATERIAL SECURION THAT ARE RECORD THE SOFT OF THE DANKINGS FOR MATERIAL SECURION THAT THE RECORD THE SOFT OF THE DANKINGS FOR MATERIAL SECURION THAT THE RECORD THE SOFT OF THE DANKINGS FOR MATERIAL SECURION THAT THE RECORD THE SOFT OF THE DANKINGS FOR MATERIAL SECURION THAT THE RECORD THE SOFT OF THE DANKINGS FOR MATERIAL SECURION THAT THE RECORD THE SOFT OF THE DANKINGS FOR MATERIAL SECURION THAT THE RECORD THE SOFT OF THE DANKINGS FOR MATERIAL SECURION THAT THE RECORD THE SOFT OF THE DANKINGS FOR MATERIAL SECURION THAT THE RECORD THE SOFT OF TH

DIVISION 2 - SITE WORK

2.1 ROCK REMOVAL

- A. ROCK SHALL BE REMOVED UTILIZING MECHANICAL MEANS. DO NOT USE EXPLOSIVES TO ASSIST IN ROCK REMOVAL UNLESS AUTHORIZED BY THE ENGINEER.
- B. ALL EXCAVATION UNDER THIS CONTRACT IS UNCLASSIFIED. NO ADDITIONAL PAYMENT WILL BE MADE FOR ROCK REMOVAL.

- AGGREGATE AND SOIL MATERIAL SHALL BE IN ACCORDANCE WITH THE DETAILS ON THE DRAWINGS GRADED IN ACCORDANCE WITH PENNDOT PUBLICATION 408 CURRENT EDITION.
- UNSTABLE SUBGRAUE DETIRED WESTE THE BOTTOU OF THE TRENH-IS FOUND TO BE INSTABLE OR THOUSE AS SHEET OWNERS RETRIEVED ORGANIC MATERIAL, OR FRACAMENTSLANCE PIECES OF INSTRUMENT AMERICAN THE OFFINION OF THE OWNER-DEVELOPMENT SHOULD BE REMOVED. THE CONTRACTOR SHALL EXAMINE AND REMOVED SUCH DISTABLE AMERICAN TO THE WINDTH AND THE OWNER OWNER OWNERS AND THE OWNER O DEPTH RECOMMENDED BY THE ENGINEER.
- ADDITIONAL EXCAVATION AND BACKFILL ABOVE AND BEYOND THE DEPTHS AND WIDTHS INDICATED IN THE CHART BELOW IN 2.3 TRENCHING WHEN REQUIRED AND AUTHORIZED BY THE ENGINEER WILL BE PAID FOR IN ACCORDANCE WITH THE APPLICABLE UNIT PRICE BID FOR MISCELLANEOUS UNCLASSIFIED EXCAVATION.
- RESTORE SURFACES TO THEIR ORIGINAL CONDITION, SUBSEQUENT SETTLEMENT OF BACKFILL SHALL BE REFILLED AND THE SURFACE SHALL BE BROUGHT BACK TO GRADE AND REFINISHED AT NO ADDITIONAL COST TO THE COWNER.

2.3 TRENCHING

EXCAVATION MATERIALS UNDER THIS CONTRACT ARE UNCLASSIFIED. ALL OTHER TYPES OF MATERIAL ENCOUNTERED WITHIN THE FOLLOWING PAY TABLE SHALL BE REMOVED AS REQUIRED WITHOUT ADDITIONAL COMPENSATION.

MAXIMUM TRENCH WIDTHS AND DEPTHS

(INCHES)	TRENCH WIDTH (INCHES)	TRENCH DEPTH (INCHES)
3/4-2	28	63
4	48	68
8	48	72

- PROVIDE SHORINGS TO PROTECT ADJACENT STRUCTURES, UTILITIES AND TO AVOID PERSONAL INJURY IN ACCORDANCE WITH STATE AND FEDERAL
- C. REMOVE EXCESS MATERIAL FROM SITE, DAIL'

2.4 SEEDING

ALL GRASS AREAS DISTURBED BY THE WORK OF THIS PROJECT SHALL BE SEEDED AS FOLLOWS:

TEMPORARY SEEDING SHALL BE DONE IN AREAS WHERE ACTIVE WORK WILL NOT BE PERFORMED FOR TWENTY DAYS (20), TEMPORARY SEEDING SHALL BE DONE IMMEDIATELY AFTER WORK CEASES.

APPLY AGRICULTURAL LIME AND FERTILIZER AS FOLLOWS FOR TEMPORARY SEEDING:

AGRICULTURAL LIME - 50 POUNDS PER 1,000 SQUARE FEET FERTILIZER - 12 POUNDS PER 1,000 SQUARE FEET

FERTILIZER SHALL BE A COMMERCIAL TYPE 10-20-20.

TEMPORARY SEED MIXTURE © ANNUAL RYEGRASS – 1 POUND PER 1,000 SQUARE FEET.

ALL TEMPORARY SEEDING SHALL BE MULCHED. TEMPORARY SEEDING SHALL BE WATERED AS REQUIRED TO DEVELOP COVER.

MULCH SHALL BE STRAW, SHALL BE CLEAN AND FREE FROM NOXIOUS WEEDS, AND SHALL BE APPLIED AT THE RATE OF 140 POUNDS PER 1,000 SQUARE FEET.

PERMANENT SEEDING SHALL TAKE PLACE IN ALL DISTURBED AREAS AS FOLLOWS

FERTILIZATION: THE FOLLOWING SHALL BE SPREAD AND WORKED INTO THE TOPSOIL TO A DEPTH OF 3 TO 4 INCHES.

AGRICULTURAL LIME - 275 POUNDS PER 1,000 SQUARE FEET FERTILIZER - 25 POUNDS PER 1,000 SQUARE FEET

THE FERTILIZER SHALL BE A COMMERCIAL TYPE 10-20-20

NOTE: IF AGRICULTURAL LIME AND FERTILIZER HAVE BEEN APPLIED PREVIOUSLY TO THE GROUND WHERE THE PERMANENT SEED IS TO BE APPLIED, THE LIME AND FERTILIZER RATES SHALL BE REDUCED BY THE AMOUNT BY WHAT HAS BEEN APPLIED PREVIOUSLY.

PERMANENT SEED MIXTURE: THE FOLLOWING SEED MIXTURES SHALL BE APPLIED AS FOLLOWS:

ON LAWN AND MOWED AREAS
KENTUCKY BLUEGRASS 12 OZ. PER 1,000 S.F
REDTOP 2 OZ. PER 1,000 S.F
PERENNIAL RYEGRASS 8 OZ. PER 1,000 S.F ANNUAL RYEGRASS
*TOTAL SEEDING

"ALL MIXTURES GIVEN ABOVE ARE FOR PLS: "PURE LIVE SEED 100 %, TO CALCULATE PLS, THE PERCENTAGE OF PURE SEED IS MULTIPLED BY THE SE FLIRE SEED AT 100 MIXTURES OF THE SE FLIRE SEED X 72% (SERIORATION) DOWNED OF 100 - 61% PLS. TO DETERMINE HOW MUCH SEED TO PLANT, DIVIDE THE PERCENTAGE RITO 100. EXAMPLE: 100 DIVIDED BY 1-13. THUS, EVERY POUND OF SEED MIXTURE CALLED FOR SHOULD THEN BE 143.

MULCH: APPLY MULCH TO ALL PERMANENTLY SEEDED AREAS.

MATERIALS: STRAW, AIR-DRIED AND FREE FROM UNDESIRABLE SEEDS AND COURSE MATERIALS. APPLICATION: 140 POUNDS PER 1,000 SQUARE FEET.

2.5 DUCTILE IRON CEMENT LINED PIPE, FITTINGS, AND COUPLINGS

- A. BELOW GRADE: DUCTILE IRON CEMENT LINED PIPE, CLASS \$2, RATED FOR \$50 PSI MINIMUM PRESSURE, INTERIOR AND EXTERIOR. ASPHALTIC COATING AND CLASS MARKING ON EXTERIOR. JOINTS WILL BE BELL AND SPIGOT (TYTON JOINT) WITH RUBBER COMPRESSION GASKETS.
- B. BELOW GRADE: FITTINGS SHALL BE DUCTILE IRON (C-153) WITH INTERIOR AND EXTERIOR ASPHALTIC COATING AND CEMENT LINING WITH MECHANICAL JOINT WITH "MEGA-LUG" RETAINER GLANDS, RUBBER GASKETS, AND ALLOY(CORTEN) BOLT SETS.
- C. 3º PIPING AND LARGER ABOVE GRADE SIMILAR TO BELOW GRADE REQUIREMENTS, EXCEPT CLASS 93, EPOXY COATED EXTERIOR IN LIEU OF ASPHALTIC COATING AND CLASS 153 THERADED FLANCE, SUNTS WITH GASKETS AND GALVANIZED STEEL BOLTS IN LIEU OF USE OF UNIFLANGES ARE NOT PERMITTED.
- D. BASIS OF DESGIN: US PIPE
- E. OPTIONAL MANUFACTURERS: AMERICAN PIPE, GRIFFIN, ATLANTIC STATES
- F. COUPLING AND TRANSITION LOCK TYPE COUPLINGS SHALL BE EPOXY FUSION COATED STEEL WITH RUBBER GASKETS, 10 INCHES LONG WITH GALVANIZED ALLOY STEEL TACKHEAD BOLTS.
- G. BASIS OF DESIGN: DRESSER STYLE 167 LOCK TYPE
- H INSTALL PIPING A MINIMUM OF 4 FEET BELOW GRADE
- I. PRESSURE AND LEAK TEST PIPING AT 50 % ABOVE NORMAL WORKING PRESSURE IN PRESENCE OF OWNER AND ENGINEER.
- J. PROVIDE ALL TESTING APPARATUS (I.E. PUMP AND MAKE-UP WATER METER). THE ALLOWABLE LEAKAGE IN GALLONS PER HOUR PER 1,000 FEET OF PIPELINE SHALL BE AS FOLLOWS:

TEST PRESSURE	NOMINA INCHES	TER	
	4	6	8
150	0.37	0.65	0.74
175	0.40	0.59	0.80
200	0.43	0.64	0.85
225	0.45	0.68	0.90

- K. DISINFECT WITH CALCIUM HYPOCHLORIDE TABLETS IN ACCORDANCE WITH AWWA 0851-92 UTILIZING THE TABLET METHOD TO INSURE A RESIDUAL OF 2 PPM PRIOR TO FLUSHING. COSTS FOR SAMPLING AND TESTING SHALL BE BORNE BY THE CONTRACTOR
- L DISPOSE OF HEAVILY CHLORINATED WATER IN A MANNER ACCEPTABLE TO PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTION.
- M. PROVIDE RESTRAINT HARDWARE, THRUST BLOCKS AND MEGA-LUG' FLANGES TO ANCHOR EXISTING AND/OR NEW VALVE AND FITTINGS TO PREVENT VALVE/FITTING SEPARATION.
- N. THE MINIMUM MECHANICALLY RESTRAINED COMBINED LENGTH OF PIPE (LF) REQUIRED TO SECURE AN ELBOW, CAP OR VALVED END FITTING SHALL BE DETERMINED BY THE FOLLOWING TABLE. COMPLIANCE WITH THE FOLLOWING TABLE IS MANDATCRY

LENGTH OF PIPE REQUIRED (LF)

	TYPE	OF FITTING					
PIPE SIZE	11-1/4°	22-1/2°	45*	90*	TEE	CAPIVALVE	_
4"	1	1	5	20	20	20	
6"	1	2	7	24	24	24	
8"	1	4	13	42	42	42	

2.6 COPPER PIPE, FITTINGS AND COUPLINGS

- A. (BELOW GRADE)COPPER TYPE K SOFT TEMPER ANNEALED WITH WROUGHT COPPER COMP. FITTINGS. (ABOVE GRADE) RIGID TYPE K WITH SOLDER FITTINGS./JOINTS.
- B. UNIONS, COUPLINGS, CURB AND CORP STOPS: BRASS, 176 PSI RATING WITH COMPRESSION ENDS.(BELOW GRADE)
- C. BALL VALVES FULL PORT BRONZE BODY CLASS 150 STAINLESS STEEL BALL, TEFLON SEAT AND LEVER HANDLE.

- A. TWO PIECE CAST IRON ASPHALTIC COATED ADJUSTABLE ROADWAY TYPE 5 1/4" INSIDE DIAMETER MARKED "WATER".

2.8 WATER DISTRIBUTION VALVES

- A. CLASS 200 RESILIENT WEDGE, DUCTILE IRON BODY, NON-RISING STEM WITH 2° OPERATING NUT, CLOCKWISE TO CLOSE, FACTORY EPOXY COATING INSIDE AND OUTSIDE, MECHANICAL JOINT WITHEGA-LUG' RETAINER SLANDS
- B. BASIS OF DESIGN: MUELLER
- C. OPTIONAL MANUFACTURER: KENNEDY, DARLING

- A BLOW-GFF SHALL BE STUDY, WITH 7" FORDISTING FF PAIL THAD 7" NOT TOZZILO OUTLET.

 LOUM-GFF SHALL BE SHAM THE SHAM THE SHAM SHOW SHAM THAD THAT SHALL BE

 OPERATED BY TURNING A TOP-MOLINTED BIFF SQUARE OPERATION SHAT SHALL BE

 DOWN OUTLET IN ALL POSITIONS FROM HAVEDEN TO FILLY-OPEN, ALL SHITSHALL

 DRAWN OUTLET IN ALL POSITIONS FROM HAVEDEN TO FILLY-OPEN, ALL SHITSHALL

 WORKING PARTS SHALL BE SERVINGABLE FROM AND SHAT SHAM THE SHALL BHE OWNER.

 ALL WEAR PARTS (GAINES AND VALVE SEAT) SHALL BE COMMONLY-AVAILABLE

 DIMENSIONS AND MATERIALS, AND KONE MAY BE OF PRODVEN, MOZE OSSIGN.
- B. BASIS OF DESIGN: KUPFERLE F.C. MODEL TF500

2.10 TAPPING SLEEVE & GATE VALVE

- A. 8° X 8° X 8° MECHANICAL JOINT TAPPING SLEEVE. CERTIFIED TO ANSINSF 81. IRON BODY WITH 34" NPT TEST PLUG, MAXIMUM WORKING PRESSURE OF 250 PSIG.
- B. BASIS OF DESIGN: MUELLER CATALOG NUMBER-H-615
- C.P MECHANICAL, NORIT X FLANCED PINGS (WITH MECHANICAL LIGHT THANSSEARLED ACCESSORISE) MEETS OR EXCEEDS ALL APPLICABLE REQUIREMENTS OR ANIMOWAY CORO STANDARD, CERTIFIED TO ANISMISH OF STANDARD, LISTED BY LINDERWITTERS LOGARITATIORS OR. AND LICE, PROVINGE BY FACTORY MUTUAL CORP. PEROVY FISIKING WEIGHT OF THE STANDARD AND THAN THE STANDARD STANDARD AND THAN THE STANDARD S

2.12 CHAIN LINK FENCE AND GATES

- A. SCHEDULE 40 FRAMEWORK WITH 2-3/8" DIA. LINE POSTS, 2-7/8" DIA. CORNER, TERMINAL, TOP POST AND GATE POSTS, 1-5/8" BRACE, DRIVEWAY AND MANWAY FRAMES. FINISH TO MATCH FENCE FASTE.
- B. 2" DIAMOND ZINC FENCE FABRIC, 9 GAUGE THICK, ALUMINUM ALLOY CAPS WITH SET SCREWS, GALVANIZED STEEL FITTINGS, 12 GAUGE 3 STRANDS-4 POINTS @ 5" o.C. ZINC-COATED STEEL BARBED WIRE.
- C. GATES SHALL BE FABRICATED IN SAME MATERIAL AND FABRIC AS FENCE. GATES SHALL BE 19 ROLLING GATE AND 3 SINCLE LEAF. INCLUDE HINDES, FORK TYPE LATCH WITH PALOCK EYE, GATE KEEPER AND GATE STOPS. PROVIDE BOTTOM TENSION WIRE AND PALLOCKS FOR GATES KEYED TO MATCH OWNERS SISTERS LOCKS.
- E. PROVIDE 100 L.F. (IF ALTERNATE IS APPROVED)

PAVING MATERIAL MAY BE PROVIDED IN ACCORDANCE WITH PENNDOT PUBLICATION 408, CURRENT EDITION AS INDICATED BELOW:

PUBLICATION 408, CORRENT	EDITION NO INDIC
MATERIAL	PUBLICATION
BASE COURSE	309
TACK COAT	460
ID-2 WEARING COURSE	409
FINE AGGREGATE	703
COARSE AGGREGATE	703
TEMP PAVING TYPE 2-P	484-BULLETII

B. PLACE EACH COURSE TO THE COMPACTED THICKNESS TO MATCH THE EXISTING PAVING, UNLESS OTHERWISE INDICATED THICKNESS SHALL NOT BE LESS THAN THE FOLLOWING MINIMUMS:

TOWNSHIP & BOROUGH - BASE COURSE 6 INCHES WEARING COURSE 2 INCHES

- C. PLACE TOPPING COURSE WITH MECHANICAL PAVER WITHIN TWENTY FOUR (24) HOURS OF PLACING AND COMPACTING BASE COURSE. COMPACT PAVING BY ROLLING. ON OTI DISPLACE OF EXTRUDE PAVIMENT FROM POSITION. HAND COMPACT IN AREAS THAT ARE INACCESSIBLE TO ROLLING.
- D. SEAL JOHTS BETWEEN NEW AND DOSTTHE PANIG JAN AT CRIESS WITH HOT BITMINGUIS MATERIA, OF THE CASS AND TYPE DESIGNATE IN POPE THE IMPROVISION FROM JOHT AT CHIEF DESIGNATION AS PRIMED TO CURRISH, OR AND THE PROPERTY L'ENTAT PROM JOHT AT CURRIS CUTWARD 12 INCHES AND UPWARD A IMPRIANA OF 2 INCHES ON THE CURRIS FACE REMOVE EXCESS MATERIA. IMPROVED YOU OPEN WITH A LICHT APPLICATION OF DRY SMO, JODITIONALLY, ANY ROXDOWN URSE (E.G. DOUBLE TELLOW DOTROE LINES, ETC.) SHOULD BE PANTED IN PLACE AT THIS
- E. INSTALL TEMPORARY PAVEMENT AT A MINIMUM THK. OF 2 INCHES AFTER COMPACTION WITH MECH. ROLLER WITH THE TOP SUPFACE. FLUSH WITH ADJACENT PAVEMENT AND MAINTAIN UNTIL PERMANENT SURFACE IS MADE. T TEMPORARY PAVINGS SHALL REMAIN BY PLACE A MINIMUM OF 30 DAYS UNLESS OTHERWISE SPECIFIED BY THE ENGINEER AMOOR PENNIOT.
- F. SAW CUT PAVING AT CUT BACKS AS INDICATED ON DETAILS. DISPOSE (OR RECYCLE CONTRACTORS OPTION) PAVING OFF SITE PROVIDING DOCUMENTATION OF DISPOSAL.
- G. TOLERANCES SHALL HAVE A FLATNESS WITH A MAXIMUM VARIATION OF 1/4" MEASURED WITH A 10 FOOT STRAIGHT EDGE. PROTECT PAVEMENT IMMEDIATELY AS REQUIRED BY PENINDOT OR RESPECTIVE TOWNSHIP OR BOROUGH CODES AND ORDINANCES.

DIVISION 3 - CONCRETE

- 3.1 PRE-CAST CONCRETE VAULT FOR WELL GO-3
- A. PRE-CAST CONCRETE SHALL BE IN ACCORDANCE WITH ASTM C-478 AND MET-ED STANDARD SPECIFICATIONS, MANUFACTURED WITH 4000 PSI CONCRETE AT 28 DAYS AND STEEL REINFORCEMENT PER ASTM A-615 GRADE 60
- LADDER RUNGS SHALL HAVE 0.5 INCH DIAMETER DEFORMED REINFORCING STEEL WITH GRADE 50 STANDARDS AND COATING SHALL BE HIGH IMPACT COPOLYMER POLLYPROPYLENE.
- C. BASIS OF DESIGN: TERRE HILL
- D. OPTIONAL MANUFACTURERS: A.C. MILLER, MONARCH

DIVISIONS 4 - 10 (NOT USED)

DIVISION 11 - EQUIPMENT

11.1 WELL / TANK LEVEL PRESSURE SENSOR/TRANSMITTERS (LE-3 & 4)

- A. SMALL BORE 5/8" Ø (LE-3 & LE-4) SUBMERSIBLE PRESSURE TRANSDUCER WITH SOLID STATE RESISTIVE SENSOR ENCLOSED IN IN A 316 STAINLESS STEEL HOUSING, 4-20MA SO GAGE POTTED WATERPROOF SHIELDED CABLE WITH LENGTH AS SPECIFIED AND FACTORY CALIBRATED.
- PROVIDE OPTIONAL 4-20MA TVSS AND CABLE SUPPORT LOCATE AT EACH WELL HEAD AND TANK.
- C. BASIS OF DESIGN: DRUCK MODEL PTX-1230

11.2 SYSTEM PRESSURE SWITCH (PSH-3)

- A. BURDON TUBE ADJUSTABLE BRASS MERCURY DPDT PRESSURE SWITCH HAVING A RANGE OF 0-200PSI
- B. BASIS OF DESIGN: MERCOID SERIES DA-31

11.3 TURBINE WATER METER (FM-3 & FM-5)

- A. BRONZE MAIN CASE MAGNETIC DRIVE, AWWA C-701 CLASS II TURBINE MEASURING ELEMENT, DIRECT READ IN GPM, ROLL SEALED REGISTER WITH BRONZE STRAINER AND COMPANION FLANGES
- B. ELECTRONIC PULSE "TRICON-E" TRANSMITTER WITH 24VDC INPUT AND 4-20MA OUTPUT FACTORY MOUNTED BETWEEN METER AND REGISTER
- C. BASIS OF DESIGN: SCHLUMBERGER / NEPTUNE

11.4 SUBMERSIBLE TÜRBINE WELL PÜMPS (GO-3)

- A. NORYL (20% GLASS FILLED) BOWELS WITH POLYCARBONATE (20 % GLASS FILLED) IMPELLORS, WITH ASTAL 300 GRADE STAINLESS STEEL MOTOR COUPLINGS AND OUTPUT SHAFT AND 4" ELECTRIC UNDERWATER DUTY MOTOR.
- B. 300 GRADE STAINLESS STEEL INTERCONNECTOR WITH ACETAL TOP INTERMEDIATE BEARINGS AND STAINLESS STEEL INTAKE SCREEN .
- C. SCHEDULE 40 GALVANIZED DROP PIPE WITH THREADED ENDS AND BRONZE WAFER CHECK VALVES.

- D. SUBMERSIBLE FLAT TYPE POWER CABLE SIZED TO LIMIT VOLTAGE DROP TO 5% AT MOTOR TERMINALS.
- E. VOLTAGE PROTECTION SYSTEM SHALL BE "SUB-TROL" CONSISTING OF RECEIVER, CONTROL FUSE BLOCK & FUSES, TVS SUPPRESSOR MODULES, SENSOR COILS AND LIGHTHING ARRESTORS COMPONENTS SHALL BE INSTALLED WITHIN THE DESIGNATED SECTION OF THE MOTOR CONTROL CENTER. REFER TO DWG E-4
- F. BASIS OF DESIGN: AERMOTOR AT SUPER SUB 50-500

11.5 PITLESS ADAPTER

- A. 8° X 10° VENTED LOCKABLE, PITLESS ADAPTER WINTEGRAL CHECK VALVE
- B. BASIS OF DESIGN BAKER MONITOR MODEL 4PS810WBWE24F4

11.6 RAW WATER TURBIDIMETER & CONTROLLER (AIT- 4 / 5)

- A. NEMA 4X WALL MOUNTED CONTROLLER, FOUR DIGIT LED INDICATOR WI SYSTEM WARNING AND TWO(2) 4-20 MA OUTPUTS, RANGE 0-10 NTU, VOLTAGE 120-1-60 WICORD AND PLUG
- B. PVC WALL MOUNTED FLOW SAMPLE VESSEL WITH PHOTOCELL, LAMP, BUBBLE TRAP AND HOSE CONNECTIONS. PROVIDE CLEAR VMYL TUBING FOR SUPPLY AND DRAIN CONNECTIONS. ALSO INCLUDE CALIBRATION MODULE AND STABLCAL STANDARD BOTTLE
- C. BASIS OF DESIGN: HACH MODEL 1720E-SC100
- D. OPTIONAL MANUFACTURERS: NONE

NEMA C FACE DESIGN AT 3467 RPM

11.7 MULTI-STAGE CENTRIFUGAL BOOSTER PUMPS (BP-1, 2 & 3)

- HIGH PRESSURE MULTI-STAGE CENTRIFUGAL PUMP PACKAGE WITH INVERTER DUTY MOTORS SHIPPED LOOSE FOR FIELD ASSEMBLY CONSISTING OF. THREE(3) VERTICAL MULTI STAGE CAST IRON STAINLESS STEEL FITTED PUMPS WITH MECHANICAL SEALS, FLANGED ENDS AND DIRECT COUPLED TEFC MOTOR WITH
- B. EXISTING BOOSTER PUMPS WILL BE REPLACED ONE BY ONE WITH NEW PUMPS IN ORDER TO KEEP THE BOOSTER PUMP STATION OPERATIONAL DURING UPGRADE.
- C. PRVS, RETURN METER, AND ASSOCIATED PIPING WILL BE REMOVED AND NEW PUMPS WILL BE TIED INTO EXISTING PIPING.

11.8 CHEMICAL FEED SYSTEM AND APPURTENANCES

- A. S6 GALLON (22° 9 X 9" H) OPAQUE CROSSLINKED POLYETHYLENE.
 TANK WITH HINKED COMER HANNES GALLON GRAUDUTTORS SHALL HAVE A 3"
 WITH A 1" NOZICE TO PROVIDE 12" SEPARATION BETWEEN THE SENDER FACE AND
 THE HIGH LOUID LEVEL. CAUSTIC SOOD ADY TANK WILL HAVE A 2" BULVE-BLOW
 WITH A 2" NOZICE EXTENSION OF A DOVE THE TANK LO TO PROVIDE REFORM FACE AND
 TRANSFER PLANE AND AN ARG OPA-BOYET THE TANK LOT OF DEVOKE BROWN FROM
 TRANSFER PLANE AND AN ARG OPA-BOYET THE TANK LOT OF TIME LOS.
- B. PVC AND POLYPROPYLENE LOW LEVEL SWITCH ASSEMBLY WITH TUBING STRAIGHTENER, CABLE AND PUMP JACK FOR LOW LEVEL SHUTDOWN
- C. PROVIDE CALIBRATION CHAMBERS, MULTI FUNCTION VALVES, INJECTION QUILLS, DIFFUSER ASSEMBLIES, CLEAR TUBING AND ASSOCIATED APPURTENANCES
- D. BASIS OF DESIGN: CHEMTAINER

- A. SOLENOID METERING PUMP FOR USE WITH SUITABLE HEADS FOR USE WI CORROSSION INHIBITOR, SODIUM HYPOCHLORITE AND CAUSTIC SODA, PUMPS SHALL HAVE ADJUSTABLE STROKE LENGTH AND FREQUENCY FOR COMPOUND LOOP CONTROL.
- B. 120-1-60 POWER INPUT WITH CORD AND PLUG.
- C. BASIS OF DESIGN: MILTON-ROY LMI SERIES AA

11.10 MOTOR ACTUATED BALL VALVE (MOV-1, 2 & 3)

- A. MATERIALS FOR HOUSING & ENCLOSURE SHALL BE ALLMINUM ALLOY, WORM GEAR SHALL BE BRONZE, AND WORM SHALL BE ALLOY STEEL. A DECLUTCH MECHANISM WILL ALLOW FOR MANULA LAUVE OF BRATION I. TERMIMAL BLOCK TO CONTAIN 24 POINTS. ENCLOSURE SHALL BE WEATHERPROOF, NEMA 4 & 6, 1967, WITH CAPTIVE ENCLOSURE COVER BCLTS.
- B 120-1-60 POWER INPUT
- D. BASIS OF DESIGN: EIM CONTROLS TYPE LCU-A MODEL HQ-018

11.11 DOUBLE WALL BULK STORAGE TANK

- A. TANK SHALL BE CONSTRUCTED OF POLYETHYLENE MATERIAL. OVERALL DIMENSIONS WILL BE 61" HIEGHT WITH A 47" DIAMETER. SHALL HAVE A 3" BULKHEZO II TOF OF TANK INSTALLED A MINIMAM OF 6" FROM TANK SIDEW WITH 3" NOZZLE TO PROVIDE 12" SEPARATION BETWEEN THE SENSOR FACE THE HIGH LIQUID LEVEL. SHALL HAVE 2" BULKHEAD FOR TRUCK CONNECTION AND A 4" BULKHEAD FOR TANK VENT.
- B. PRIMARY TANK CAPACITY OF 6.21 GPI FOR A TOTAL OF 250 GALLONS.
- C. SECONDARY TANK CAPACITY OF 7.35 GPI FOR A TOTAL OF 336 GALLONS D. BASIS OF DESIGN: ASSMANN MODEL IMT-250-2

11.12 CHLORINE/PH ANALYZER (AIT-6/7)

- UNIT SHALL BE CAPABLE OF MEASURING FREE CHLORINE (RANGE 0-0.20 TO 0-20 MGL), AND TOTAL CHLORINE (RANGE 0-0.20 TO 0-20 MGL). THE ACCURACY SHALL BE THE GREATER OF 0.05 MGLI OR +/- 6 PERCENT OF READING, INLET PRESSURE SHALL BE FROM 2-60 PSI.
- B. 120-1-60 POWER INPUT WITH CORD AND PLUG.
- C. UNIT SHALL BE CAPABLE OF MEASURING PH VALUES FROM 4 TO 10. D. BASIS OF DESIGN: WALLACE & TIERNAN DEPLOX 3 W/ PH PROB

11.13 STATIC MIXER

- MIXER BODY TO BE CONSTRUCTED OF 3-INCH DIAMETER SCHEDULE 40 EPOXY COATED STAINLESS STEEL PIPE WITH FLANGED ENDS.
- MIXER WILL CONSIST OF 6 MIXING ELEMENTS AND HAVE A LAYING LENGTH OF 28 INCHES.
- C. BASIS OF DESIGN: KOFLO CORPORATION SERIES 275

11.14 ULTRASONIC TANK LEVEL SENSORS (LIT-7, 8, 9 & 10)

- A. THE CONTINUOUS LEVEL TRANSMITTER SHALL EMPLOY AN ULTRASONIC LEVEL MEASURING PRINCIPLE. IT SHALL CONTROL AN ISOLATED 4-20 MADC, HART OUTPUT PROPORTIONAL TO LEVEL, DISTANCE OR FLOW RATE INTO A LOOP RESISTANCE OF 550 OHMS AT 24VICE. THE SENSOR SHALL BE CAPABLE OF BEING MOUNTED IN A NIMINAL 3 INCH DIAMETER NOZZE EAN DE RECESSED UI
- B. THE SYSTEM SHALL MEET THE REQUIREMENTS OF NEMA 4X FOR CORROSION RESISTANCE AND WASH DOWN SERVICE. MAXIMUM POWER INPUT SHALL BE 30
- C. BASIS OF DESIGN: SIEMENS SITRANS THE PROBE LU MODEL 7ML5221

11.15 CHEMICAL TRANSFER PUMP

- PUMP BODIES WILL BE MADE OF A NON-CORROSIVE NON-METALIC MATERIAL.
 UNIT SHALL HAVE FLEXIBLE LINER THAT IS CHEMICALLY RESISTANT TO CAUSTIC SODA AND SHALL BE FIELD REPLACABLEWITHOUT THE USE OF SPECIAL TOOLS.
- B. THE PUMP SHALL BE SELF PRIMING AND CAPABLE OF RUNNING DRY. SHAFT AND ROTOR BEARINGS SHALL BE COMPLETELY ISOLATED FROM THE FLUID CAVITY.
- C. MOUNT PUMP VERTICALLY TO BLOCK WALL WITH EXPANDING METAL LUG
- D. 120-1-60 POWER INPUT TO 1 H.P. MOTOR

DIVISIONS 12 - (NOT USED)

E. BASIS OF DESIGN: VANTON FLEX-I-LINER MODEL SIZE 90

DIVISIONS 13 - SPECIAL CONSTRUCTION

- 13.1 GLASS FUSION BOLTED WATER STORAGE TANK MODIFICATION CONSTRUCT 10' ADDITIONAL SIDE WALL HEIGHT TO EXISTING GLASS FUSED TO STEEL WATER STORAGE TANK IN ACCORDANCE WITH IBC-2006 BASED UPON 2000 PSF SOIL BEARING CAPACITY, SEISMIC ZONE 2A, 100 MPH WIND LOADS AND
- 30 PSF SNOW LOADS. B. EXTERIOR COLOR SHALL BE TAN, APPURTENANCES SHALL INCLUDE BUT NOT LIMITED TO. SCHEDULE 80 PVC RISER PIPE, LEVEL SENSOR CONDUIT, PIPE SUPPORTS AND OVERFLOYTH OF GRADE, RELOCATED 30° JUL DAVIT TYPE BOTTOM ACCESS MANWAY, OSHA HOT DIPPED GALVANIZED LADDER AND CAGE ASSEMBLY, AND ADDITIONAL ANODE CATHODIC PROTECTION, REFER TO DETAILS ON DWGS. FOR ADDITIONAL INFORMATION.
- C. TANK CAPACITY SHALL BE 53,000 GALLONS BASED UPON A A DIAMETER OF 20FT AND 24FT SIDE WALL WATER DEPTH.
- TANK UPGRADE SHALL BE DESIGNED AND STAMPED BY A PROFESSIONAL ENGINEER LICENSED IN THE COMMONWEALTH OF PENNSYLVANIA. E. TANK SHALL BE CLEANED INSIDE AND OUT. DO NOT EXCEED 60 PSI ON TANK SEALER WHEN USING A PRESSURE WASHER. PAINT ALL OVERFLOW PVC PIPING TAN FOR UV PROTECTION.
- F. BASIS OF DESIGN: A.O. SMITH NORTHEAST AQUASTORE / DICK GREEVES OR BRIAN HYDE (215) 361-6700

DIVISION 15 - MECHANICAL

15.1 SUPPORTS AND ANCHORS

- A. WALL AND CEILING SUPPORTS SHALL BE EPOXY COATED MALLEABLE IRON ADJUSTABLE SPLIT RING WITH MOUNTING PLATE AND THREADED ROD. B. FLOOR AND PIPING SUPPORT SHALL BE SHOP FABRICATED FLANGE OR PIPE CRADLE, GALVANIZED UNIT W/2*Ø SCH 40 PIPE AS MANUFACTURED BY STANDON.
- C. CONCRETE WEDGE OR EPOXY TYPE ANCHORS AS MANUF, BY HILTI, D. SUPPORT PIPING AT 6' O.C. AND AT CHANGE OF DIRECTION.

- 15.2 MECHANICAL IDENTIFICATION
- PLASTIC NAMEPLATES: LAMINATED PLASTIC; 34" HIGH, ENGRAVED LETTERS; CONTRASTING BACKGROUND. B. INTERIOR PIPE MARKERS - PRESSURE SENSITIVE VINYL MARKER WITH DIRECTIONAL ARROWS SETON OPTI-CODE. C. FENCE SIGN - CUSTOM WORDED OSHA METAL BACKED PLASTIC-SIZE 14"x10".
- D. OSHA WARNING SIGN CUSTOM ENGRAVED PLASTIC LAMINATED WITH NFPA DIAMOND FOR CHLORINE GAS SETON FLEX, SIZE 24"x14".

E. PROVIDE NAMEPLATES FOR ALL DEVICES & EQUIPMENT. COORDINATE WIENG, LOCATE PIPE MARKERS A MIN. OF 8' O.C. AND AT EACH CHANGE OF

- 15.3 VENT AND DRAIN PIPING A. PIPING AND FITTINGS PVC SCHEDULE 40 DWV; JOINTS - SOLVENT WELD.
- A. 4 1/2" DIAMETER LIQUID FILLED 0-200 PSI RANGE WITH STAINLESS STEEL MOVEMENT.

B. BASIS OF DESIGN: ASHCROFT 15.5 AIR RELEASE AND VACUUM VALVES

- A. CAST IRON BODY WITH 1/2" NPT CONNECTION AND WITH STAINLESS STEEL TRIM
- B. AIR VENT TO BE PIPED TO FLOOR DRAIN C. BASIS OF DESIGN: GA INDUSTRIES FIG. 930

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OWL MECH
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15.6 ABOVE GRADE INTERIOR PIPING

- A. RAW, TREATED AND FINISHED WATER PIPING LOCATED WITHIN MECHANICAL ROOM: TYPE K RIGIO COPPER, SOLDERED CONNECTIONS FOR PIPE ESESTIAN Z DAMMETER AND MPT THEREOFF OR Z DIAMETER AND ADOVE. SCIENCIAL BY DIVOS ON LOCATION OF THE PIPE AND ADDVE. SOLDEN'S TO TRANSITION TO WILKER PIPE MATERIALS.
- B. BALL VALVES HALL BE NICKEL PLATED BRASS BODY, TYPE 316 STAINLESS STEEL FULL PORT BALL, TEFLON SEATS, VITON SEALS, LEVER HANDLE AND
- 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.
- 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 WALLISHELF MOUNTED 20 GALLON GLASS LINED 18°0' X 25" WATER HEATER WITH 2500 WATT ELEMENT RELIEF VALVE. VOLTAGE 208-1-80 VOLT SINGLE PHASE INPUT
- B. BASIS OF DESIGN: RHEEM-RUUD MODEL EGSP20

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

- A 11" DIAMETER STANALESS STEEL BOWL WIO DRAIN TRAP. CHROME PLATED EYE WASH WITH FACE RING. CHROME PLATED STAY OPEN 12" MPT CONNECTION BALL VAILE, "IF DOWNLIT CHROME AND HOMO DEPERATE DISK PLATE. 10 SIGN GREEN ABS PLATE: 0 SHOWER-BOD WITH INTEGEN. 20 GPM FLOW CONTROL. CHOW PLATED STAY OPEN BALL VALVE WITH STANALESS EXTER PLATE. ROO AND TRANSCALAR HANGLE BERKREISCY SIGN AND TEST TAG MOLANTED ON OR NEAR STATION BY PLAN YELD.
- B. BASIS OF DESIGN: HAWS CORPORATION MODEL 8300

15.10 WATER-TEMPERING EQUIPMENT

- A. THERMOSTATIC MINNO, VALVE, DESIGNES TO PROVIDE 65 DEG E TEPIO, POTABLE SWITER AT BERSEGINE PO LIMBRIG PROVIDES TO MANTHAIN TEMPERATURE AT PLUS OR MINNS 5 DEG F THROUGHOUT REQUIRED ISAMINUTE EST PERSION, AND IN CASE OF UNIT FAULTE TO CONTINUE COLD-WATER FLOW, WITH UNION CONNECTIONS, CONTROLS, METAL PIPING, AND CORROSORNESSISTATIC VEROLOSINE.
- 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 26" X 5.75" TO HOLD 3-55 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)

- 3.1.2 THE SOURCE RELIEF VALVE (NY.) AND TO AN ARISE IN NAET PRESSURE TO PROTECT THE SYSTEM FROM EXCESSIVE PRESSURES. IF A PRESSURE TO PROTECT THE SYSTEM FROM EXCESSIVE PRESSURES. IF A PRESSURE THE PRESSENCE THE PRESSURE THE PR
- 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: CLA-VAL MODEL 50-01

15.13 HORIZONTAL MECHANICAL LEVEL SWITCH (LS-5)

- A. FLOAT AND STEM SHALL BE MADE OF POLYPHENYLENE SULFIDE (PPS) PLOAL 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 18 AWG CONNECTIONS
- C. BASIS OF DESIGN: W.E. ANDERSON MODEL L-8

15.14 VERTICAL MECHANICAL LEVEL SWITCH (LS-6)

- A. FLOAT AND STEM SHALL BE MADE OF SS318 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. ANDERSON MODEL F7-SS2

15.15 PIPE INSULATION

- A. INSULATION SHALL BE 38" WALL THINKNESS, FLEXIBLE ELASTOMERIC MATERIAL, BLOCK IN COLOR, AND SUPPLIED AS UNSLIT TUBING. INSULATION WILL BE RESISTANT TO MOLD.
- B. BASIS OF DESIGN: ARMAFLEX TUBES

Inc. Pottsville, PA ph: 570.628.5655 Mountain Top, PA ph: 570.868.0275

A S. Fourth Street
Reading, PA 19602 p
ph: 610.373.6667 M
fc: 610.373.7537 p





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		SMC	SMC	SMC	SMC	GddV
		ISSUED FOR BIDDING	ISSUED FOR DEP PERMIT	ISSUED FOR PRE-FINAL PAW / CLIENT REVIEW	ISSUED FOR PRELIMINARY CLIENT REVIEW	ISSUED FOR/REVISED
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AS NOTED PREPARED BY: DYH CHECKED BY:
JDB/SMITH
APPROVED BY:
SMC
PROJECT NO.
8136.01
DRAWING NO.

C-9



Pennsylvania American Water

GLEN ALSACE DISTRICT RUSCOMBMANOR TOWNSHIP, BERKS COUNTY, PA

GOLDEN OAKS WELL GO-3 AND FACILITY UPGRADES

Craig Darosh, P.E. Project Manager

Jim Gable **Network Supervisor**

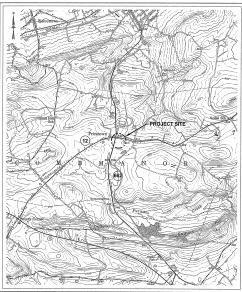
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SEPTEMBER 15, 2008

DRAWING INDEX

DRAWING NO.	DISCIPLINE	DESCRIPTION
C8-1	CIVIL / MECH & ELECT	COVER SHEET, DRAWING INDEX & PROJECT NOTES
CS-2	CIVIL / MECH & ELECT	DISCIPLINE SPECIFIC LEGENDS
1-1	CIVIL / MECH & ELECT	INDEX SITE PLAN
DEMOLITION		
D-1	CIVIL / MECH	GOLDEN OAKS WELL FACILITY PIPING PLAN, IMAGES & KEYED NOTES
D-2	ELECTRICAL	DEMOLITION WELL / PUMPING FACILITY
CIVIL \ MECHA	NICAL	
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-6	CIVIL / MECH	WELL / PUMPING FACILITY PIPING PLAN, SECTIONS AND DETAILS
C-6	CIVIL / MECH	EQUIPMENT SCHEDULES, SECTIONS AND DETAILS
C-7	CIVIL / MECH	EXISITING CLEARWELL TANK PLAN, SECTIONS & DETAILS
C-8	CIVIL / MECH	GENERAL / MECHANICAL TECHNICAL SPECIFICATIONS
C-9	CIVIL / MECH	GENERAL / MECHANICAL TECHNICAL SPECIFICATIONS
ELECTRICAL		
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

DESIGN PA ONE CALL



LOCATION / TOPOGRAPHICAL MAP



GENERAL PROJECT NOTES

- ALL UNDERGROUND UTILITIES TO BE LOCATED BY THE CONTRACTOR

- ARY PUMPING SYSTEMS WITH THE MEANS AND METHODS MUST VIDED TO ACCOMMODATE CONTINUOUS OPERATION OF THE LOAKS WELL FACILITY.
- SPECIFIED EQUIPMENT WILL BE ATTENDED TO BY FACTORY TECHNICIANS DURING FACILITY START UP. SALES REPRES IS NOT AN ACCEPTABLE SUBSTITUTION.

DRAWING CONVENTIONS





INDICATES DRAWING NUMBER OF WHICH DETAIL/PLAN IS SHOWN





ELEVATION OR PROFILE LETTER





SECTION OR DETAIL WAS REFERENCED INDICATES NEW WORK/FEATURES





DENOTE EQUIPMENT / SYSTEMS TO BE REMOVED

KEYED DRAWING NOTES

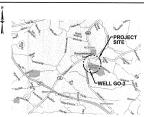
WORK ON A INDIVIDUAL DRAWING OR SHEET

KEYED DEMOLITION NOTES

(G2) DEMOLITION WORK BY GENERAL CONTRACTOR (E-1) DEMOLITION WORK BY ELECTRICAL SUB-CONTRACTOR

REFERENCE DRAWINGS

VITILO CORP. DWG TITLED UTILITY LOT SUBDIVISION FOR GOLDEN OAKS RESIDENTIAL" PLAN NO.E98017CU-D1 SHT 1 OF 1 GREAT VALLEY CONSULTANTS - SITE PLAN - DATED 8-9-07



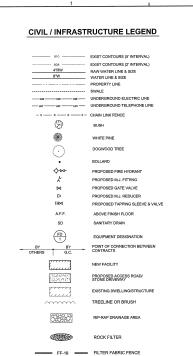
VICINITY MAP





						٧
		ISSUED FOR BIDDING	ISSUED FOR DEP PERMIT	NEVD FOR PRE-FINAL PAW/ CLIENT REVIEW	ISSUED FOR PRELIMINARY CLIENT REVIEW	ISSUED FOR/REVISED
		0	o	00	٧	REV.
		8/15/08	11/16/07	10/31/07	10/8/07	DATE
ı						

CS-1



Z POSITION DRIVE/ACTUATE

P & ID LEGEND

RW RAW WATER
TW TREATED WATER
POTABLE WATER

ELECT.SIGNALS (ANALOG & DISCRETE) REMOTE TERMINAL UNIT

BALL VALVE

CHECK VALVE

GATE VALVE

FLOWMETER

STRAINER

MOTOR OPERATED BALL VALVE

PRESSURE REDUCING VALVE

CHLORINE

RTU

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MECHANICAL LEGEND

—	BALL VALVE
9"	PRESSURE GAUGE W/ GAUGE COCK
—D—	REDUCER
T	THERMOSTAT
	PIPING UP
	PIPING DOWN
CFM	DIRECTION OF INTAKE OR EXHUAST AND QUALITY OF AIR IN CFM
Ν	CHECK VALVE
N	BUTTERFLY VALVE

ELECTRICAL LEGEND

	FUSE CIRCUIT BREAKER	Φ.	WALL MOUNTED LUMINAIRE, TYPE AND SIZE AS INDICATED ON THE PLANS
tanan' isana	CIRCUIT BREAKEN	Se	LIGHTING SWITCH, # INDICATES NUMBER OF POLES
	DISCONNECT SWITCH	Ю	SIMPLEX RECEPTACLE
\perp	GROUND	⊭	DUPLEX RECEPTACLE
<u>∓</u>	NORMALLY OPEN		DISCONNECT SWITCH, TYPE AND SIZE AS INDICATED ON THE PLANS
11	CONTACT	•	GROUND ROD
- -	NORMALLY CLOSED CONTACT NORMALLY OPEN		NEW WIRING IN CONDUIT, EXPOSED OR CONCEALED IN WALLS OR CEILING SPACES, NUMBER OF SLASHES INDICATE NUMBER OF WIRES, OTHER THAN GROUND
F	TEMPERATURE SWITCH	***	WIRES, IN CONDUIT
OFF	HELD OPEN LIMIT SWITCH	#	NEW WIRING IN CONDUIT, CONCEALED BENEATH FLOOR OR UNDERGROUND, NUMBER OF SLASHES INDICATE NUMBER OF WIRES, OTHER THAN GROUND WIRES, IN CONDUIT
HAND AUTO	HAND-OFF-AUTO		BRANCH CIRCUIT HOMERUN TO PANEL, NUMBER OF ARROWS INDICATE NUMBER OF CIRCUITS
(±	SELECTOR SWITCH	9	MOTOR, NUMBER INDICATES HORSEPOWER, F FOR FRACTIONAL
-(#)-	"MS" = STARTER COIL,	LA	4-20mA LOOP SURGE PROTECTOR
0	"CR" = CONTROL RELAY	AI AO	ANALOG INPUT ANALOG OUTPUT
J √IOF		MS	MANUAL MOTOR STARTER
8 🛣	OVERLOAD RELAY	STP	SHIELDED TWISTED PAIR
1 1		WP	WEATHER PROOF
1		N.O.	NORMALLY OPEN
	CONDUCTORS NOT	N.C.	NORMALLY CLOSED
	CONNECTED	SPD	SURGE PROTECTION DEVICE
1.1	CONDUCTORS CONNECTED	Ø	UTILITY POLE
++	CONDUCTORS CONNECTED		HEAVY LINE = NEW ITEM
			LIGHT LINE = EXISTING ITEM
×	TERMINAL BLOCK	E	UNDERGROUND ELECTRIC
23	FOR REMOTE WIRING	OHE	OVERHEAD ELECTRIC
			FIELD WIRING FROM PANELS
$ \sim$	PILOT LIGHT, R-RED, G-GREEN, A-AMBER	GFI	GROUND FAULT INTERRUPT
\sim		(MCP)	MOTOR CIRCUIT PROTECTOR
$\overline{}$	RELAY COIL	,,	(MAGNETIC ONLY)
	NEEDY COIL	SPD	SURGE PROTECTOR
1		P.M.R.	POWER MONITORING RELAY
	PUSH BUTTON	TP	TWISTED PAIR
	CONNECTION POINT	E.C.	ELECTRICAL CONTRACTOR
		1F-K	MCC CUBICLE
¥	TELEPHONE OUTLET	☆-	DRAWOUT
0	FLUORESCENT LUMINAIRE) 3P. 7A	
G	CONDUIT TURNING DOWN	MCP MCP	BREAKER TRIP RATING
Θ	CONDUIT TURNING UP		
~~	FLOW SWITCH	⊥ FVNR ⊤ SIZE 1	
n	THERMOSTAT	SIZE	NORM SACE
	JUNCTION BOX	S O.L -	MOTOR OVERLOADS
		ſ	
m	PRESSURE TRANSMITTER	ļ	
ille m	TRANSFORMER, SIZE AS NOTED		
000	TRANSFER SWITCH	2	MOTOR HORSEPOWER
-^-	INTERLOCK	P-2 CHLORINE PUN	EQUIPMENT DESCRIPTION

ARCHITECTURAL LEGEND



ROUGH WOOD BLOCKING (CONTINUOUS) ROUGH WOOD BLOCKING (NON CONTINUOUS)

PLYWOOD

BATT/LOOSE FILL INSULATION

R.O. M.O. ROUGH OPENING MASONRY OPENING E.W. EL. ELEVATION WELDED WIRE FABRIC

WWF MIN. MINIMUM PLC'S PLACES REO'D REQUIRED REINFORCING BARS

REBAR EXP. PMJF PREMOLDED JOINT FILLER CJ EMB. CONTROL JOINT EMBEDMENT EXIST. EXISTING PLATE TYPICAL ALUM ALL MINEDA

Pennsylvania
American Water
COMBINATOR MALL GOS AND FACILITY UPGRADES
ONLI, MECHANICA, ELECTRICAL
DISCIPLIA REPERFICAL
DISCIPLIA SPECIFIC LEGENDS

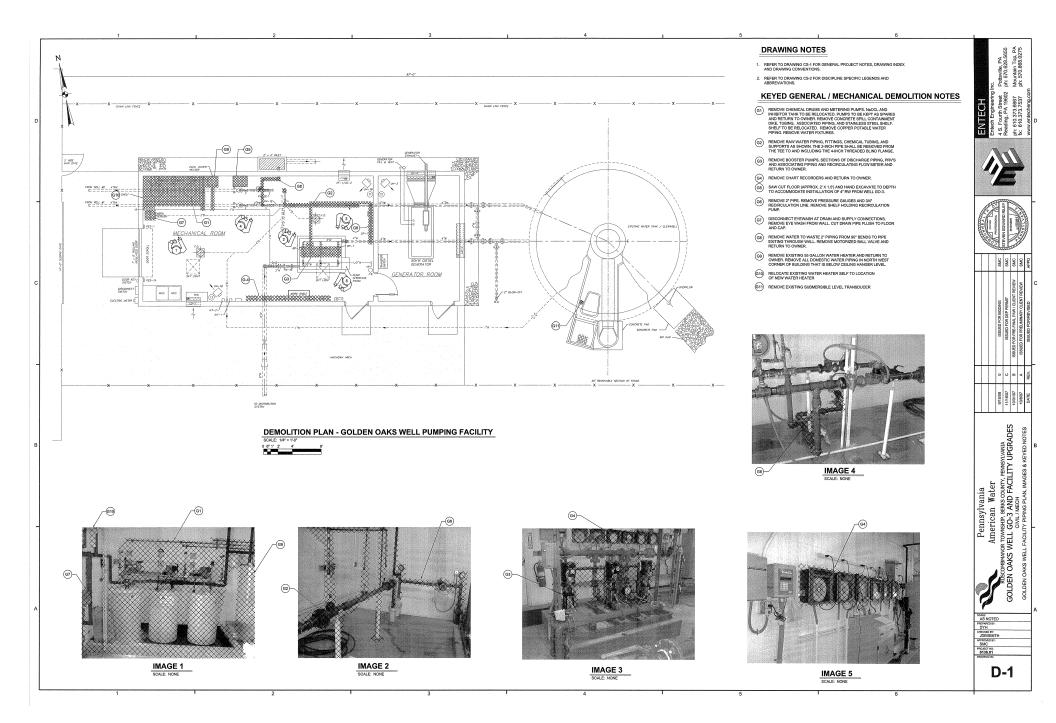
CS-2

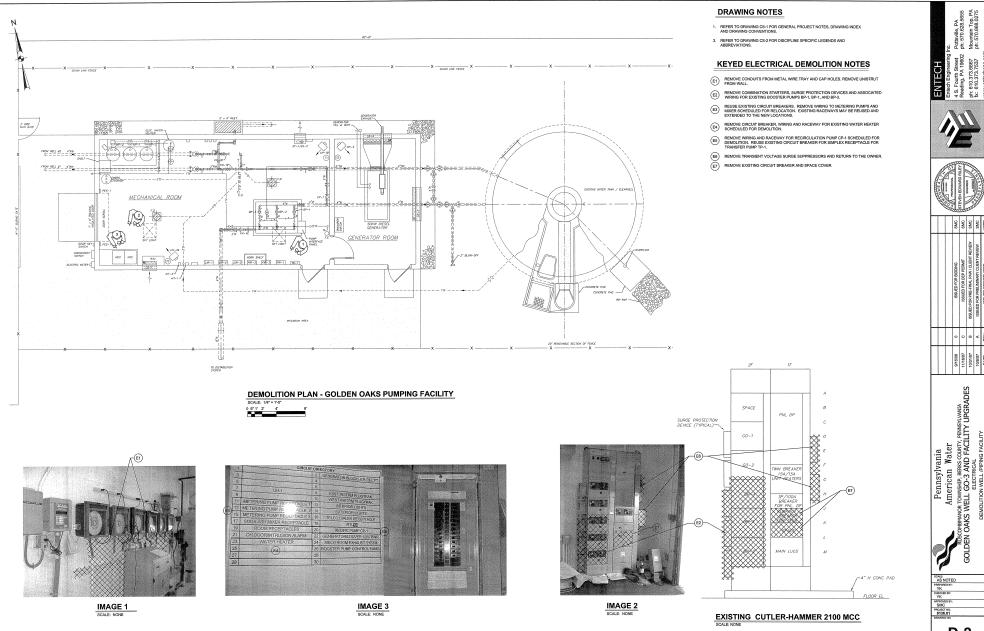
INSTRUMENTATION SYMBOL LEGEND

TELEPHONE POLE

0	MOUNTED LOCALLY	
Θ	MOUNTED ON FACE OF PANEL	INSTRUMENT SYMBOLS
\ominus	MOUNTED BEHIND PANEL DOOR	SUMENT
\square	ALARM LIGHT	INSTE
	NOT ACCESSIBLE TO OPERATOR	NTROL
	ACCESSIBLE TO OPERATOR	DISTRIBUTED CONTROL SYMBOLS OR SHAPED INSTRUMENTS
	AUXILLIARY LOCATION	SHARE
	NOT ACCESSIBLE TO OPERATOR	MAKABLE LLER 3
	ACCESSIBLE TO OPERATOR	PROGRAMMBLE CONTROLLER SYMBOLS
\Diamond	COMPLEX OR UNDEFINED INTERLOCK	INTER- LOCK SYMBOLS

	INSTRUMENTATION	DEVICE SCHEDULE
	FIRST LETTER	SUCCEEDING LETTERS
	MEASURED VARIABLE	DISPLAY OR OUTPUT FUNCTION
A	ANALYSIS	ALARM
В	BURNER	-
С	CHLORINE	CONTROL
D	DENSITY DIFFERENTIAL	-
E	VOLTAGE	PRIMARY ELEMENT
F	FLOW RATE	-
G		GLASS/GAUGE
н	HAND	HIGH
1	CURRENT	INDICATE
J	POWER	SCAN
K	TIME	CONTROL STATION
L	LEVEL	LOW/LIGHT
М	MOISTURE/MALFUNCTION	MIDDLE
N	TURBIDITY	-
0	•	ORIFICE
Р	PRESSURE/VACUUM	
Q	QUANTITY	INTEGRATE/TOTALIZE
R	REMOTE	RECORDER/PRINT
s	SPEED/FREQUENCY	SWITCH
Т	TEMPERATURE/TORQUE	TRANSMIT
U	MULTIVARIABLE	MULTIFUNCTION
٧	VISCOSITY/VIBRATION	VALVE
w	WEIGHT	-
X	AS DEFINED	RELAY
Y	STATUS	COMPUTING OR SIGNAL CONVERTING



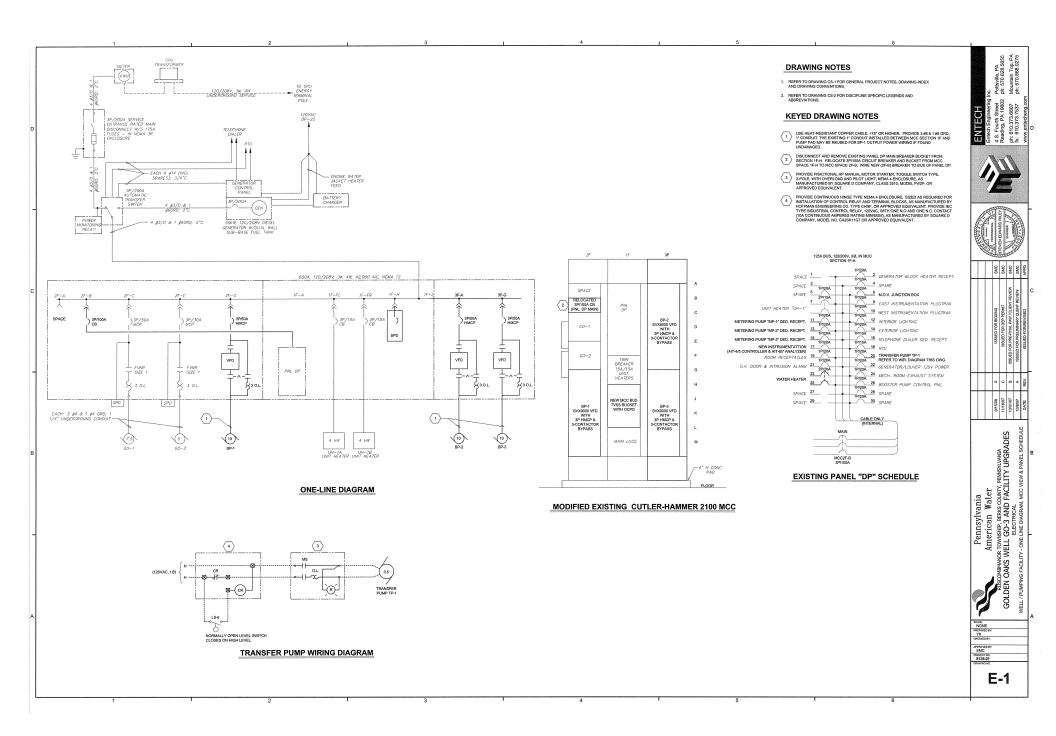


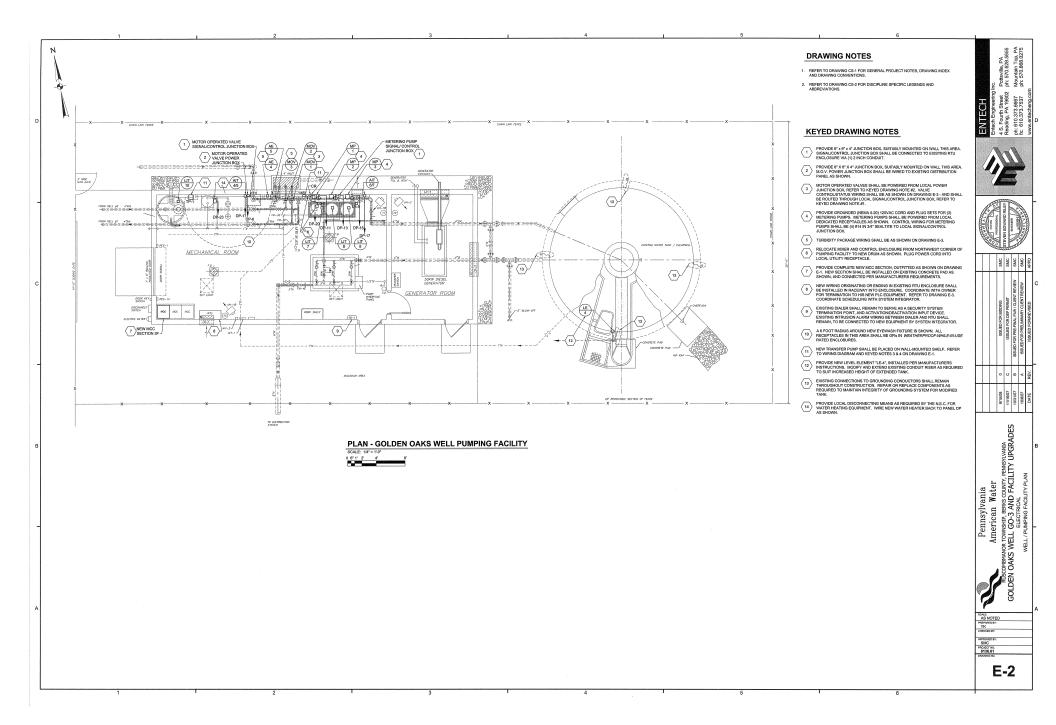
Inc. Pottsville, PA ph: 570.628.5655 Mountain Top, PA ph: 570.868.0275

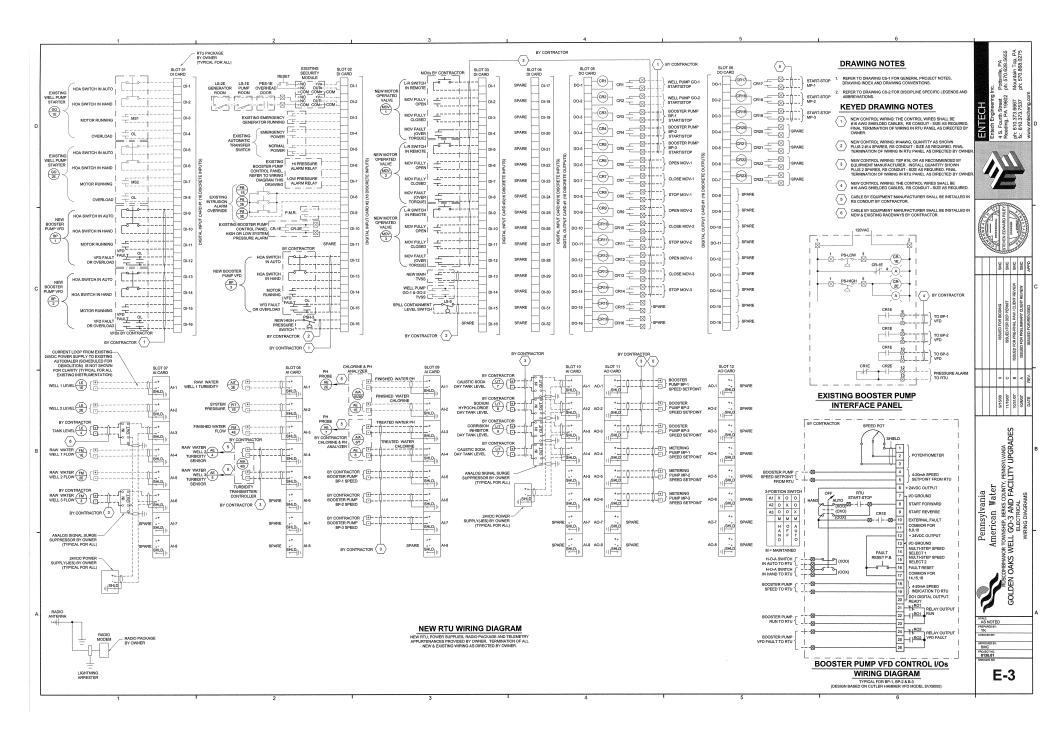


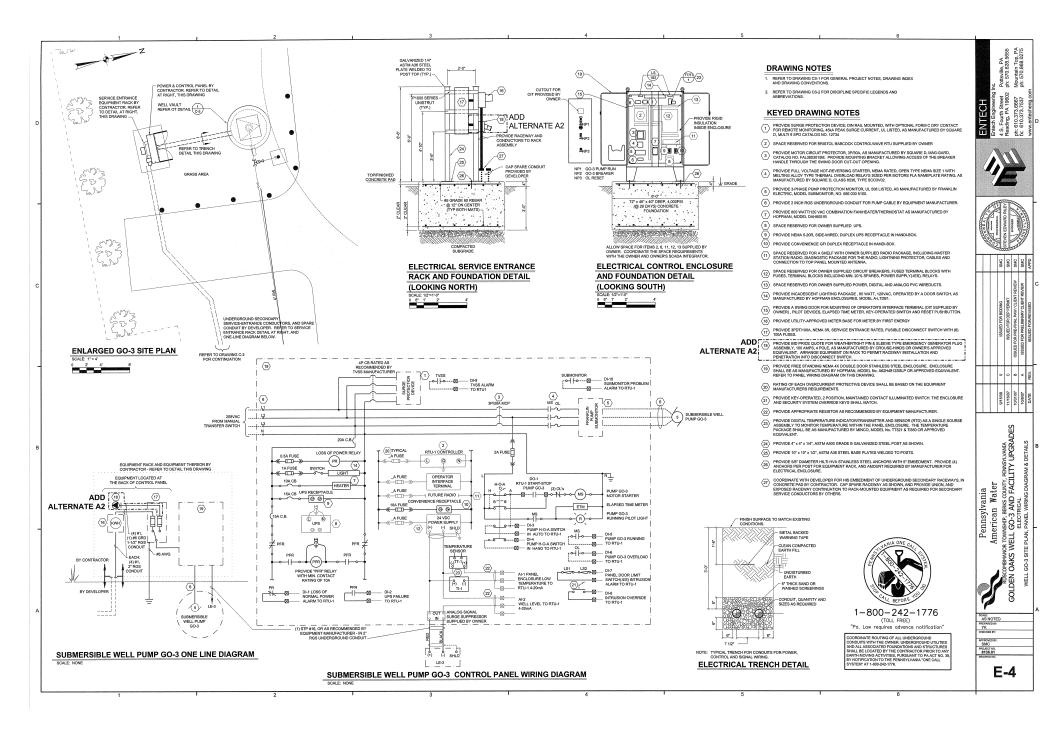


D-2









CONDENSED ELECTRICAL TECHNICAL SPECIFICATIONS:

NOTE: VIGN: THESE DEWINES, AND SPECIFICATIONS WITH THE PROJECT LIMITAL.
WITH IMPRINCES ANY STRUCTURE OF BODDING AND SOCRE OF WINNEY THAT WAS
ISSUED IN A 10', 3.1" FORMAT AS AN ATTACHMENT TO THESE DRAWINGS, AND BE
SO HONGOED IN THE PREPARATION OF THE PROPOSAL AND EXECUTION OF THE
CONTRACT. THE FOLLOWING SPECIFICATIONS ARE PROVIDED FOR THE MAJOR
PRECS OF EQUIPMENT.

16.1 GENERAL DESCRIPTION

A. WARRANTY

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

B. CODES AND STANDARDS

- PROVIDE EQUIPMENT AND INSTALLATION IN ACCORDANCE WITH THIS SPECIFICATION AND APPLICABLE REQUIREMENTS OF THE FOLLOWING:
 AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)
 AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

- MERICAN SOCIETY FOR TISTING AND MATERIALS (ASTIN)
 AREDICANS WITH DISBURIES AND TIPLUL DAY 197-395)
 AREDICANS WITH DISBURIES AND TIPLUL DAY 197-395)
 AREDICANS WITH DISBURIES AND TIPLUL DAY 197-395
 AREDICAN SOCIETY OF ANY CO-AMOUNT DISBURIES (ASTINI DISBURIES AND TIPLUL DAY 197-395)
 OLDER TIPLUL DAY 197-395
 METANICIPLE AND TIPLUL DAY 197-39
- REGULATIONS k. ALL LOCAL CODES AND ORDINANCES
- 2. THE CONTRACTOR SMALL GETARN ALL PERMITS, LICENSES, AND APPROVALS WITH THE EXPERIMENT'S MANUAL GETARN ALL PERMITS, LICENSES, AND APPROVALS WITH THE EXPERIMENT AND APPLICATION OF THE WORK CONTRACTOR SHALL MORE ALL CERTIFICATES FOR WORK FOR WHICH CERTIFICATES ARE AND AND APPLICATION OF THE WORK FOR WORK FOR WHICH CERTIFICATES ARE AND TOWNISH FOR EXPERIMENT AND APPLICATION OF THE WORK FOR AND APPLICATION OF THE WORK FOR AND APPLICATION OF THE WORK FOR AND TOWNISH FEER PREMITS, LICENSES, LAWS, ANDOOR OTHER FEES WHICH MAY BE REQUIRED IN THE PEPPORAMACE OF HIS CONTRACT AND NOT OTHERWISE PROVIDED FOR

16.2 DEMOLITION

- REMOVE, RELOCATE, AND EXTEND EXISTING INSTALLATIONS TO ACCOMMODATE NEW CONSTRUCTION.
- REMOVE COMBINATION STARTERS AND SURGE PROTECTION DEVICES AS SHOWN ON DRAWING D.2 AND RETURN TO THE COWNER. COORDINATE DEMOLITION WITH THE COWNER. EXISTING PUMP AND PUMP STATTERS SHALL BE REPLACED ONE ONE ALLOWING THE BOOSTER PUMP STATION OPERATION DURING UPGRADE.
- 3. REMOVE ABANDONED WIRING TO THE SOURCE OF ITS SUPPLY
- 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 DEMOLITICAL.
- REPAIR AND PATCH ADJACENT CONSTRUCTION AND FINISHES DAMAGED DURING DEMOLITION AND EXTENSION WORK.
- MAINTAIN ACCESS TO EXISTING ELECTRICAL EQUIPMENT AND INSTALLATIONS WHICH ARE TO REMAIN ACTIVE DURING THE CONSTRUCTION PERIOD.

- GALVANIZED RIGID STEEL CONDUIT SHALL BE MILD STEEL PIPING, HOT DIP GALVANIZED AFTER FABRICATION WITH A LUNFORM THICKNESS OF ZINC PAPPLED CONDUIT BOOKES OF ZINC PAPPLED CONDUIT BOOKES SHALL BE THREADED THEY OF JOINT OF CONDUIT BOOKES SHALL BE THREADED THEY OF JOINT CHOOMED THE OFFICE AND CONDUIT SHALL BE INSTALLED UNDERGROUND AND IN EXPOSED INDOOR AND OUTDOOR LOCATIONS.
- LIQUID-TIGHT FLEXIBLE METAL CONDUIT SHALL BE FORMED FROM CONTINUOUS. LENGTH OF SHRALLY WOUND, INTERCOCIED ZINC-COATED STIMP STEEL AND OFFICE OF SHALL BE UNDUSTANT AND APPROVED FOR VISE WITH LIQUID-TIGHT CONDUIT. LIQUID-TIGHT CONDUIT SHALL BE INSTALLED FOR FINAL CONNECTION TO EQUIPMENT AND INSTRUMENTATION.
- 3. MAINTAIN MINIMUM 12 INCH CLEARANCE BETWEEN CONDUIT AND HEAT SUPPORT RIGID METALLIC CONDUIT AT A MAXAMUM OF 10 FEET ON CENTER. SUPPORT FLEXIBLE METALLIC CONDUIT AT NO NORMETALLIC CONDUITS AT DISTANCES NOT EXCEEDING NEC
- 4 WHERE CONDUIT PENETRATES A WALL, THE PENETRATION SHALL BE SEALED WATERTIGHT.

QUALITY ASSURANCE: SUPPORT SYSTEMS SHALL BE ADEQUATE FOR WEIGHT OF EQUIPMENT AND CONDUIT, INCLUDING WIRING, WHICH THEY CARRY.

MATERIAL:
 A. SUPPORT CHANNEL: GALVANIZED STEEL IN ACCORDANCE WITH ASTM A 446.
 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 ANG-OR PRESST INSERTS IN SOLID MASONRY WALLS: SELF-ORILLING ANCHOR
- EXPANSION ANCHOR ON CONCRETE SURFACES; SHEET METAL SCREWS IN SHEET METAL STUDS; AND WOOD SCREWS IN WOOD CONSTRUCTION. B. DO NOT FASTEN SUPPORTS TO PIPING, DUCTWORK, MECHANICAL EQUIPMENT, OR CONDUIT.
- C. DO NOT USE POWDER-ACTUATED ANCHORS.
- D. DO NOT DRILL STRUCTURAL STEEL MEMBERS.
- E. 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.
- 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, 800 VOLT INSULATION, TYPE THUN, COMPLYING WITH UL 83.
- B. CONTROL CIRCUITS, COPPER, STRANDED CONDUCTOR 600 VOLT INSULATION, TYPE THWN, COMPLYING WITH UL 83 INSIDE ENCLOSURE TYPE SIS.
- C. ALL WIRING SHALL BE INSTALLED IN RACEWAY.
- 2. INSTRUMENTATION CARE. SHELDED AND ASSESSED RETRIMENTATION WRING SHALL BE STRANGED COPPER PARS TWISTED TOGETHER HAVING A THRENG SHALL BE STRANGED COPPER PARS TWISTED TOGETHER HAVING A THRENG COPPER PARS THREE ADD CHARLE TO LOCKET, INSTRUMENTATION CAREING SHALL BE OF THE SIZE AND TYPE RECOMMENDED BY THE SPECIFIC COUPLENET MANUFACTURES, OR HEAVING STEP BECEN 1918. ALL RETRIMENTATION CARE SHALL BE RUN IN ROCID STEEL COMDUIT SEPARATE FROM ALL POWER OR CLASS I CONTROL CRECKING.
- 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. 6 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:

 - PHASE B RED PHASE C BLUE NEUTRAL WHITE GROUND GREEN

6. 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 MANUFACTURER'S SPECIFICATIONS.
- D. CORRECT MALFUNCTIONING PRODUCTS AT SITE, WHERE POSSIBLE, AND RETEST TO DEMONSTRATE COMPLIANCE; OTHERWISE, REMOVE AND REPLACE

WITH NEW AND RETEST. 7. APPLICATIONS

- A. CONCEALED INTERIOR LOCATIONS: BUILDING WIRE IN RACEWAYS
- B. EXPOSED INTERIOR LOCATIONS: BUILDING WIRE IN RACEWAYS.

16.6 UNDERGROUND ELECTRICAL WORK

- OTHERWISE.
- INSTALL NONMETALLIC CONDUIT AND DUCT AS INDICATED ACCORDING TO MANUFACTURER'S WRITTEN INSTRUCTIONS. BURIAL DEPTH MINIMUM 36 INCHES BELOW FINISHED GRADE.
- 3. A BRIGHTLY COLORED PLASTIC TAPE WITH SUITABLY, INSCRIBED MESSAGE AT NOT MORE THAN 10-POOT NITEROALS SHALL BE FLACED PROCOMATED IN THE PROPERTY OF THE PROPERTY OF THE TAPE SHALL BE LANGING OF THE TAPE SHALL BE MANUFACTURED WITH INTEGRAL WIRES, FOIL BACKING OF THE TAPE MEANS TO ENABLE DETECTION BY A METAL DETECTIOR. THE TAPE SHALL BE ENLOSED IN A PROTECTIVE JOINT OF TO PROTECTIF FROM CORPOSION.

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

16.8 ELECTRICAL IDENTIFICATION

- ALL WIRE AND CABLE SHALL BE MARKED. POWER CABLES SHALL BE COLOR CODED AS NOTED IN PARAGRAPH 16.5. 6.B. CONTROL AND INSTRUMENTATION WIRE SHALL BE NUMBERED AT BOTH ENDS.
- ENGRAVED THREE-LAYER LAMINATED PLASTIC, BLACK LETTERS ON A WHITE BACKGROUND.
- PROVIDE NAMEPLATES TO IDENTIFY ALL ELECTRICAL DISTRIBUTION AND CONTROL EQUIPMENT, AND LOADS SERVED.
- PROVIDE SELF-ADHESIVE WARNING LABELS, FACTORY PRINTED, MULTICOLOR, CONFIGURED FOR DISPALY 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

- 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
- A. PROVIDE CLIPPER POWER SYSTEM TVSS WITH CIRCUIT BREAKER, SERVICE ENTRANCE TYPE, SUITABLE FOR 3-PHASE WYE, 208VAC, 250KA SURGE CURRENT FER PHASE.
- B. MANUFACTURER: CUTLER HAMMER, MODEL CPS-250

3. VARIABLE FREQUENCY DRIVES (VFDs)

- A. VFDs SHALL BE PROVIDED FOR PUMPS (BP-1 THRU BP-3) WITH FOLLOWING MOTOR LOADS: EACH 10 HP
- B. MANUFACTURER: CUTLER HAMMER, MODEL SYX9000
- C. THE VFD SHALL BE ULLISTED, SUITABLE FOR PUMP APPLICATION, VARIABLE TORQUE, AND RATED FOR 3 PHASE, 208 VOLT OPERATION.
- THE VFD SHALL BE EQUIPPED WITH THE FOLLOWING FEATURES:

 1) INCOMING LINE TYPE HIMOP MOTOR CIRCUIT PROTECTOR
- INCOMING LINE 1195 FINAL MODE TO A STATE OF THE PROPERTY OF T
- OVERLOAD RELAY FOR BYPASS LINE REACTOR EMI FILTER IMPUT PHASE LOSS, IMPUT OVERVOLTAGE AND LINE SURGE PROTECTION OUTPUT SHORT CIRCUIT, GROUND FAULT, AND OUTPUT PHASE
- PROTECTION OVERTEMPERATURE, DC OVERVOLTAGE, DRIVE AND MOTOR OVERLOAD
- 9. OWERTEMERATURE, DO VERVOLTAGE, DRIVE AND MOTOR OVERLOAM
 PRODREMONE TRESPED POTENTIONED TETE
 11) FACTORY INSTALLED AUGULARY CONTACTS
 12) FACA SELECTORY SINTEM LYM AUGULARY CONTACTS
 14) FACA SELECTORY SINTEM LYM AUGULARY
 15) FACA SELECTORY
 16) STANDAMOB LANGE TONE FAULT, DYPASS, RUN
 16) DOOR-MOUNT (REYPADIDEPLAY
 16) DOOR-MOUNT (REYPADIDEPLAY
 17) A 2-80m SOLUTION CONTROL/PRAISE SPEED INPUT

-) 4-20mA ISOLATED CONFIGURABLE S:) 4-20mA SPEED/FREQUENCY OUTPUT) DISCRETE FAULT ALARM OUTPUT () DISCRETE DRIVE RUNNING OUTPUT
- E. INSTALL VFDs, TVSS, POWER AND CONTROL WIRING PER MANUFACTURER'S WRITTEN INSTRUCTIONS.

- RECEPTALES SHALL BE SPECIFICATION GRADE. THE FACE AND ALXISODY OF THE RECEPTAL ES SHALL BE SPECIFICATION GRADE. THE FACE THAT SHALL BE TREVEL WHE. T-SLOT, ONE-PIECE COPPERALLY DESIGN THE RECEPTALE SHALL INCLUDE A GREEN GROUND SCREW ATTACHED TO THE BODY OF THE RECEPTACE SHALL BE RATED 26-AMPERE, 125-VAC, NEMA CONFECURATION 2507, SECOND WITHOUT SHALL BE RATED 26-AMPERE, 125-VAC, NEMA CONFECURATION 2507, SECOND WIRED WITH AN HORY PRIMEY.
- E. GROUND FAULT CIRCUIT INTERRUPTER RECEPTACLES (GFG) SHALL HAVE A NYLON FACE AND A THERMOPLASTIC BACKBODY. GFG! RECEPTACLES SHALL BE U.CLASS A WITH A SMILLIAMPER, GROUND-FAULT TRIP LEVEL, GFG! RECEPTACLES SHALL BE RATED 26-AMPERE, 125-V AC, NEMA CONFIGURATION 5-20R, SIGE WIRED WITH AN NOW! FINISH.
- 3. GENERAL USE WALL PLATES SHALL BE TYPE 430 BRUSHED STAINLESS STEEL. THE PLATE SHALL BE OF A MODERN DESIGN WITH ROUNDED EDGES AND
- I. ALL RECEPTACLES INSTALLED IN WET LOCATIONS, PROVIDED FOR USE WITH UNATTENDED EQUIPMENT SHALL BE INSTALLED IN A "RAINTITE WHILE IN USE" ENCLOSURE. THE ENCLOSURE SHALL BE UL LISTED FOR USE IN WET LOCATIONS WITH A PLUG CONNECTED.

16.11 SECONDARY GROUNDING

- ELECTRICAL GROUNDING SYSTEM SHALL FULLY COMPLY WITH THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE ARTICLE 250, AND SHALL INCLUDE THE FOLLOWING.
- CONNECT ALL NONCURRENT CARRYING METAL PARTS SUCH AS METAL CONDUITS, RACEWAYS, OUTLET BOXES, CABINETS, SUPPORTS, AND SIMILAR PARTS OF ALL ELECTRICAL EQUIPMENT AND APPARATUS TO THE GROUNDING SYSTEM.
- 3. FOUIPMENT GROUNDING CONDUCTORS: COMPLY WITH NEC ARTICLE 250 FOR TYPES, SIZES, AND QUANTITIES OF EQUIPMENT GROUNDING CONDUCTORS, EXCEPT WHERE SPECIFIC TYPES, LARGER SIZES, OR MORE CONDUCTORS THAN REQUIRED BY NEC ARE INDICATED.
- PROVIDE A SEPARATE, GREEN INSULATED EQUIPMENT GROUNDING CONDUCTOR FOR ALL FEEDER AND BRANCH CIRCUITS, TERMINATE EACH ON A GROUNDING LUG, BUS, OR BUSHING.
- GROUNDING RODS: COPPER-CLAD STEEL, 3/4 INCH BY 10 FOOT UNLESS OTHERWISE INDICATED. UNDERGROUND GROUNDING CONDUCTORS: BARE COPPER WIRE, BURIED AT LEAST 36 INCHES BELOW GRADE.
- BOND INTERIOR METAL PIPING SYSTEMS AND ASSOCIATED EQUIPMENT WITH BRAIDED-TYPE BONDING STRAPS.
- 8. USE EXOTHERMIC-WELDED CONNECTIONS FOR UNDERGROUND CONNECTIONS.
- MEASURE GROUND RESISTANCE AT SERVICE ENTRANCE AND SUBMIT RESULTS
 TO OWNER/ENGINEER. GROUND RESISTANCE NOT TO EXCRED 19 OHMS. IF THIS
 RESISTANCE CANNOT BE OSTRIBLED PROVIDE ADDITIONAL RODS INSTALLED AT
 NOT LESS THAN 6 ON CENTER.

18.12 ELECTRICAL SERVICE ENTRANCE FOR WELL GO-3 STATION

- NEW ELECTRICAL SERVICE RATED AT 208 VOLTS, 100 AMPS, 3 PHASE, 4 WIRE. APPLICATION FOR ELECTRICAL SERVICE WILL BE DONE BY OTHERS.
- 2. COORDINATE WITH OWNER TO EXTEND SERVICE LATERAL (BY DEVELOPER) TO NEW, UTILITY-APPROVED METER BASE, AND PROVIDE GROUNDING TO UTILITY COMPANY SPECIFICATIONS.
- PROVIDE UL LISTED AND LABELED METER SOCKET MEETING MET-ED 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 METE AND MUST CERTIFY THAT THE WIRING SYSTEM IS IN COMPLIANCE WITH ALL APLICABLE ORDINANCES HAWING
- 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 SIX (8) FUSES: CLASS R, DUAL ELEMENT, CURRENT LIMITING, TIME DELAY, ONE TIME FUSE.

- PROVIDE FREE STANDING STAINLESS STEEL ENCLOSURE WITH SWING PANEL.
 RTU RELATED ITEMS WILL BE PROVIDED BY OWNER AND INSTALLED BY OWNER
 SCADA INTEGRATOR, COORDINATE WITH OWNER THE SPACE REQUIREMENTS
 REQUIRED FOR INSTALLATION OF ALL COMPONENTS WITHIN THE ENCLOSURE.
- 2. PROVIDE LOCK KIT / KEY-OPERATED HANDLE FOR THE ENCLOSURE. TH ENGLOSURE KEY AND SECURITY-OVERRIDE KEY (REFER TO KEYED NOTE 21 ON DRAWING E-4) SHALL BE MATCHING.
- 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 MANUFACTURER'S WRITTEN INSTRUCTIONS.

16.14 FIELD CHECK-OUT AND CALIBRATION

- PROVIDE ALL LABOR, MATERIAL, AND EQUIPMENT NECESSARY TO FURNISH AND INSTALL A COMPLETE AND OPERABLE SYSTEM IN EACH LOCATION.
- AFTER ELECTRICAL INSTALLATION IS COMPLETE, MAKE TESTS TO DEMONSTRATE THAT ENTIRE SYSTEM IS IN PROPER WORKING GROER AND IN ACCORDANCE WITH DRAWINGS AND SPECIFICATIONS, MAKE NO TESTS LESS THAN OUTLINED HERBAFTER, UNLESS REQUESTED IN WRITING AND APPROVED BY THE COMPER. TESTS ARE IN ADDITION TO AND FOR SUBSTITUTION FOR TESTS OF INDIVIDUAL.
- PROVIDE A MINIMUM OF TWO DAYS START-UP AND TESTING ASSISTANCE, INCLUDING CALIBRATION, AS REQUIRED, FOR ALL ELECTRICALLY POWERED EQUIPMENT AND ELECTRONIC CONTROLS.
- PAY ALL COSTS FOR TESTS, INCLUDING COSTS TO RETEST OCCASIONED BY DEFECTS AND FAILURES OF EQUIPMENT TO MEET SPECIFICATIONS.
- A. REPLACE WIRING AND EQUIPMENT FOUND DEFECTIVE, OR FAILING TO MEET SPECIFIED REQUIREMENTS, WITHOUT CHARGE, UNLESS WRITTEN ACCEPTANCE FOR REPAIR IS GIVEN BY OWNER. B. FURNISH THREE COPIES OF ALL TEST RESULTS TO OWNER.

CONDUCT TESTS IN PRESENCE OF OWNER

5. CALIBRATION: FURNISH SUITABLE ELECTRICAL INSTRUMENTS, INCLUDING VOLTIMETERS, AUMETIES, WAITHETERS, TACHOMETERS, AND ALL OTHER EQUIPMENT NECESSARY TO PERFORM TESTS SPECIFIED, MAKE NECESSARY OPENINGS IN CRIGIUST FOR TESTING INSTRUMENTS AND PLACE AND CONNECT ALL INSTRUMENTS, GOUPMENT, AND DEVICES, INCESSARY FOR THE TESTS. UPON COMPLETION OF TESTS, REMOVE INSTRUCTIONS AND INSTRUMENT CONNECTIONS AND RESTORE ALL GROUNTS TO PERSONNET COMMITTING.

8 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 MISULATION RESISTANCE TESTS OF CIRCUITS (80 VKLT A MD BLOV)
 10 ON HOT SIBLECT CONDUCTORS NATIOS SINV COST AND BLOW TO ORDER
 POTENTIAL DELECTRIC TESTS. TEST COMPLETE FEEDER AND BRANCH
 CIRCUIT OF BOO VUIS OR BLOW WITH EVERTHING MET POWER SUPPLY
 AND POWER-CONSUMING COLIPAINT, CONNECTIED THERETO
 OFFICIAL PROPERTY OF THE CONTROL ON THE CONTROL OF THE CONTROL OF THE CONTROL ON THE CONTROL OF THE CONTROL ON THE CONTROL OF THE CONTROL ON THE C
- 4) ALL CARLES FAILING INSULATION TEST SHALL BE REMOVED. REPLACED.
- 4) ALL CABLES FAILING INSULATION TEST SHALL BE REMOVED, REPLACED, AND RE-TESTED.
 5) WHERE TESTS OF ANY OF THE ABOVE-REPERENCED EQUIPMENT ARE INCLUDED IN OTHER SECTIONS OF SPECIFICATIONS, COORDINATE TESTING, AS DIRECTED BY OWNER, TO AVOID DUPLICATION AND CONFLICT BETWEEN TESTS.
- PERFORM ABOVE TESTS IN ADDITION TO, AND NOT IN SUBSTITUTION FOR REQUIRED MANUFACTURER'S FACTORY TESTS.

B. OPERATING TESTS:

- 3. OPERATION TESTS.
 1. OPERATE SEACH MOTOR AND ASSOCIATED EQUIPMENT UNDER NORMAL OPERATING CONDITIONS FOR A SUPPICIENT LENGTH OF TIME TO DEMONSTRATE CONDERST AUGMENT, TRANSPERATURE RISE, SPEED, AND DEMONSTRATE CONDERST AUGMENT, TRANSPERATURE RISE, SPEED, AND NAR. AR A POSSIBLE.
 1. OPERATIC EDITION TERMINIST AND CONTROL DEVICES TO SHOW CORRECT AND SATISFACTORY OTERATIONS.
 1. OPERATIC EDITIONS.
 1. OPERATIONS.
 1. OPERATIONS.

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.



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373.6



			SMC	SMC	SMC	SMC	APPD
			ISSUED FOR BIDDING	ISSUED FOR DEP PERMIT	ISSUED FOR PRE-FINAL PAW / CLIENT REVIEW	ISSUED FOR PRELIMINARY CLIENT REVIEW	ISSUED FORREVISED
			0	o	8	٧	REV.
			9/15/08	11/16/07	10/31/07	10/8/07	DATE

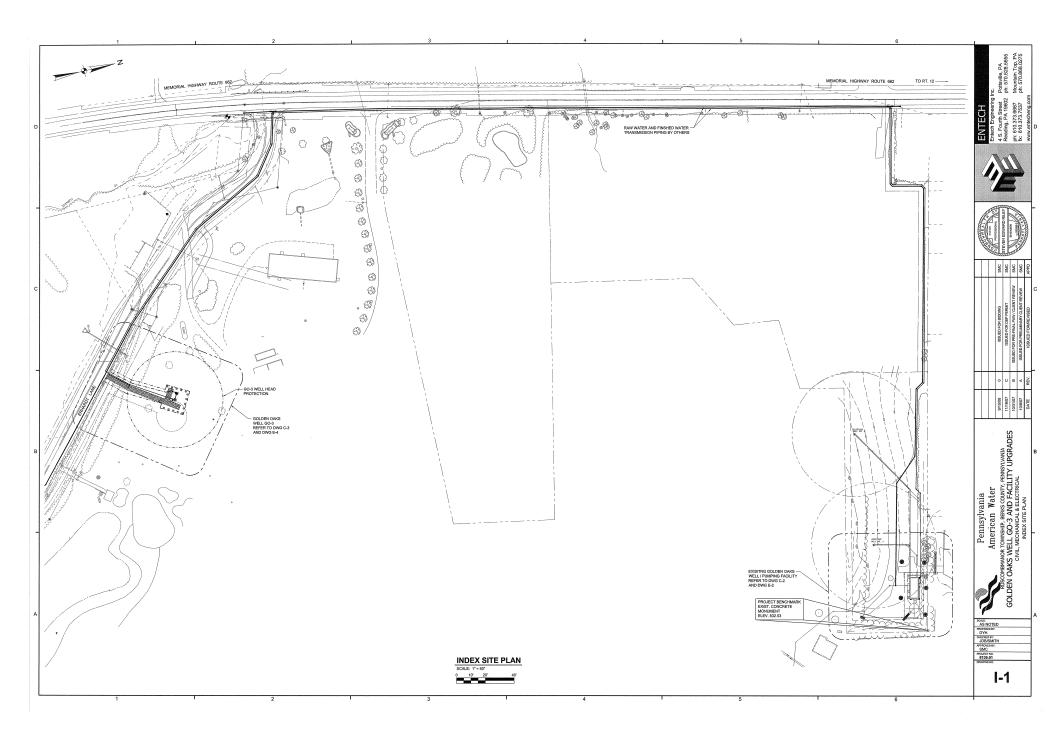
UPGR/ Pennsylvania American Water R TOWNSHIP, BENS COUNT, PE VELL GO-3 AND FACILI ELECTRICAL WELL

OAKS

GOLDEN AS NOTED

E-5

PROJECT NO 8136.01



DRAWING INDEX

DRAWING NO.	DISCIPLINE	DESCRIPTION
CS-1	CIVIL / MECH & ELECT	COVER SHEET, DRAWING INDEX & PROJECT NOTES
C\$-2	CIVIL / MECH & ELECT	DISCIPLINE SPECIFIC LEGENDS
1-1	CIVIL / MECH & ELECT	INDEX SITE PLAN
DEMOLITION		
D-1	CIVIL / MECH	GOLDEN OAKS WELL FACILITY PIPING PLAN, IMAGES & KEYED NOTES
D-2	ELECTRICAL	DEMOLITION WELL / PUMPING FACILITY
CIVIL \ MECHA	NICAL	
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	EXISITNG CLEARWELL TANK PLAN, SECTIONS & DETAILS
C-8	CIVIL / MECH	GENERAL / MECHANICAL TECHNICAL SPECIFICATIONS
C-9	CIVIL / MECH	GENERAL / MECHANICAL TECHNICAL SPECIFICATIONS
ELECTRICAL		
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