

WBS Lvl 1	WBS Lvl 2	WBS Lvl 3	WBS Lvl 4	Description	Takeoff Quantity	Labor Productivity	Man Hours	Labor Price	Labor Amount	Material Cost/Unit	Material Amount	Subcontract Cost/Unit	Subcontract Amount	Const Equip Cost/Unit	Const Equip Amount	Process Equip Cost/Unit	Process Equip Amount	Total Amount	Grand Total Amount
			03.04	Walls															
				Keyway 6"	2,230 lf	0.050 mh / lf	112	39.49 /mh	4,404	0.67	1,499	-	-	-	-	-	-	5,903	9,245
				Vertical Wall Keyway 6"	502 lf	0.110 mh / lf	55	39.49 /mh	2,181	0.67	337	-	-	-	-	-	-	2,518	3,964
				Panel Form System 18" h	40,125 sf	0.190 mh / sf	7,625	39.49 /mh	301,107	1.84	73,744	-	-	-	-	-	-	374,851	588,489
				Waterstop 6" Flat	2,732 lf	0.110 mh / lf	301	39.18 /mh	11,776	2.10	5,738	-	-	-	-	-	-	17,514	27,347
				Strip & Oil Wall Forms	40,125 sf	0.005 mh / sf	201	39.17 /mh	7,859	0.03	1,204	-	-	-	-	-	-	9,063	14,267
				Superplasticizers @ Walls	1,115 cy					8.40	9,367	-	-	-	-	-	-	9,367	14,217
				Rebar- Walls (125 #/cy)	70 tn	15.003 mh / tn	1,050	43.53 /mh	45,712	997.70	69,839	-	-	-	-	-	-	115,551	178,346
				Finish- Top of Wall	3,345 sf	0.008 mh / sf	27	39.17 /mh	1,048	-	-	-	-	-	-	-	-	1,048	1,659
				Pump Place Walls 18"	1,115 cy	1.150 mh / cy	1,283	41.39 /mh	53,082	-	-	-	-	6.65	7,414	-	-	60,496	95,813
				4000 psi Concrete	1,115 cy					142.00	158,330	-	-	-	-	-	-	158,330	240,300
				Grind/Patch Walls	40,125 sf	0.013 mh / sf	522	39.17 /mh	20,435	0.03	1,204	-	-	-	-	-	-	21,639	34,169
				Rub Walls	31,161 sf	0.058 mh / sf	1,807	39.17 /mh	70,788	0.06	1,870	-	-	-	-	-	-	72,658	114,875
				Liquid Curing Compounds	43,470 sf	0.002 mh / sf	87	39.17 /mh	3,406	0.06	2,557	-	-	-	-	-	-	5,962	9,271
				03.04 Walls	1,115 cy		13,069		521,797	292.10	325,689			6.65	7,414			854,901	1,331,960
			03.05	Slab On Grade															
				Slab Edge Form 28"	172 sf	0.350 mh / sf	60	39.49 /mh	2,378	1.31	226	-	-	-	-	-	-	2,603	4,106
				Rebar- SOG (125 #/cy)	1 tn	14.003 mh / tn	8	43.53 /mh	366	997.70	599	-	-	-	-	-	-	964	1,487
				Mesh Support - bricks (.12/sf)	37 ea	0.002 mh / ea	0	43.53 /mh	3	0.26	10	-	-	-	-	-	-	13	20
				Finish- Hard Trowel	304 sf	0.015 mh / sf	5	39.17 /mh	179	-	-	-	-	-	-	-	-	179	283
				Pump Place Slab on Grade 8" @ Electrical & Blower Room	7 cy	0.500 mh / cy	4	41.39 /mh	145	-	-	-	-	3.67	26	-	-	171	270
				Pump Place Thickened Slab 28" x 20"	2 cy	0.500 mh / cy	1	41.39 /mh	41	-	-	-	-	3.67	7	-	-	49	77
				4000 psi Concrete	9 cy					142.00	1,278	-	-	-	-	-	-	1,278	1,940
				Saw Cut S-O-G (.08/sf)	24 lf	0.030 mh / lf	1	39.17 /mh	28	0.17	4	-	-	0.95	23	-	-	55	87
				Liquid Curing Compounds	476 sf	0.002 mh / sf	1	39.17 /mh	37	0.06	28	-	-	-	-	-	-	65	101
				Seal Floors	304 sf	0.002 mh / sf	1	39.17 /mh	24	0.09	28	-	-	-	-	-	-	52	80
				6 Mil. Vapor Barrier	350 sf	0.002 mh / sf	1	43.53 /mh	30	0.05	18	-	-	-	-	-	-	49	76
				Gravel Fill Under Slab 4"	8 cy	0.004 cd / cy	1	1,412.15 /cd	43	29.26	234	-	-	3.84	31	-	-	308	472
				03.05 Slab On Grade	9 cy		82		3,274	269.41	2,425			9.62	87			5,785	9,000
			03.06	Suspended Flat Slab															
				Form Suspended Slab Bottom	7,342 sf	0.180 mh / sf	1,322	39.49 /mh	52,196	2.18	16,038	-	-	-	-	-	-	68,234	106,953
				Slab Edge Form 12"	1,501 sf	0.250 mh / sf	375	39.49 /mh	14,821	5.17	7,762	-	-	-	-	-	-	22,583	35,237
				Strip & Oil Suspended Slab Forms	8,843 sf	0.005 mh / sf	44	39.17 /mh	1,732	0.04	363	-	-	-	-	-	-	2,095	3,292
				Superplasticizers	272 cy					8.40	2,285	-	-	-	-	-	-	2,285	3,468
				Rebar- Suspended Slab (225 #/cy)	31 tn	20.004 mh / tn	612	43.53 /mh	26,644	997.70	30,530	-	-	-	-	-	-	57,173	88,505
				Finish- Hard Trowel	7,372 sf	0.030 mh / sf	221	39.17 /mh	8,664	-	-	-	-	-	-	-	-	8,664	13,712
				Pump Place Suspended Slab 12"	272 cy	1.800 mh / cy	490	41.39 /mh	20,268	-	-	-	-	6.65	1,810	-	-	22,078	34,959
				4000 psi Concrete	272 cy					142.00	38,624	-	-	-	-	-	-	38,624	58,620
				Liquid Curing Compounds	16,215 sf	0.003 mh / sf	49	39.17 /mh	1,906	0.68	11,069	-	-	-	-	-	-	12,975	19,816
				03.06 Suspended Flat Slab	272 cy		3,113		126,231	392.17	106,670			6.65	1,810			234,710	364,562
			03.07	Suspended Beams															
				Beam Side Forms	6,264 sf	0.210 mh / sf	1,316	39.49 /mh	51,954	2.21	13,815	-	-	-	-	-	-	65,769	103,196
				Beam Bottom Forms	1,814 sf	0.210 mh / sf	381	39.49 /mh	15,046	2.21	4,001	-	-	-	-	-	-	19,046	29,885
				Chamfer	2,418 lf	0.015 mh / lf	36	39.49 /mh	1,433	0.57	1,371	-	-	-	-	-	-	2,804	4,349
				Strip & Oil Beam Forms	8,078 sf	0.005 mh / sf	40	39.17 /mh	1,582	0.03	242	-	-	-	-	-	-	1,825	2,872
				Superplasticizers @ Beams	174 cy					8.40	1,462	-	-	-	-	-	-	1,462	2,219
				Rebar- Beams (250 #/cy)	22 tn	15.003 mh / tn	330	43.53 /mh	14,367	997.70	21,949	-	-	-	-	-	-	36,316	56,051
				Finish- Top of Beam	1,814 sf	0.008 mh / sf	15	39.17 /mh	569	-	-	-	-	-	-	-	-	569	900
				Pump Place Beams @ Roof	174 cy	2.001 mh / cy	348	41.39 /mh	14,411	-	-	-	-	14.42	2,509	-	-	16,920	26,801
				4000 psi Concrete	174 cy					142.00	24,708	-	-	-	-	-	-	24,708	37,500
				Grind/Patch Beams	8,078 sf	0.013 mh / sf	105	39.17 /mh	4,114	0.03	242	-	-	-	-	-	-	4,356	6,879
				Rub Beams	8,078 sf	0.085 mh / sf	687	39.17 /mh	26,893	0.06	485	-	-	-	-	-	-	27,378	43,300
				Liquid Curing Compounds	9,892 sf	0.002 mh / sf	20	39.17 /mh	775	0.06	582	-	-	-	-	-	-	1,357	2,110
				03.07 Suspended Beams	174 cy		3,278		131,143	395.73	68,857			14.42	2,509			202,509	316,061
			03.08	Pads & Curbs															
				Pad Form	1,267 sf	0.120 mh / sf	152	39.49 /mh	6,005	1.37	1,730	-	-	-	-	-	-	7,734	12,129
				Chamfer	447 lf	0.015 mh / lf	7	39.49 /mh	265	0.57	254	-	-	-	-	-	-	518	804
				Strip & Oil Equipment Pad Forms	1,267 sf	0.005 mh / sf	6	39.17 /mh	248	0.03	38	-	-	-	-	-	-	286	450
				Rebar- Pads (100 #/cy)	2 tn	18.003 mh / tn	33	43.53 /mh	1,450	997.70	1,846	-	-	-	-	-	-	3,295	5,096
				Finish- Float	1,444 sf	0.017 mh / sf	25	39.17 /mh	961	-	-	-	-	-	-	-	-	961	1,522
				Pump Place Pads	37 cy	1.601 mh / cy	59	41.39 /mh	2,451	-	-	-	-	7.49	277	-	-	2,728	4,320
				4000 psi Concrete	37 cy					142.00	5,254	-	-	-	-	-	-	5,254	7,974
				Liquid Curing Compounds	2,711 sf	0.003 mh / sf	8	39.17 /mh	319	0.06	159	-	-	-	-	-	-	478	746
				03.08 Pads & Curbs	37 cy		290		11,699	250.82	9,280			7.49	277			21,256	33,042
			03.09	Pan Stair Fill															
				Finish Stairs	415 sf	0.055 mh / sf	23	39.17 /mh	894	-	-	-	-	-	-	-	-	894	1,415
				Pump Place Pan Stair Concrete	6 cy	3.001 mh / cy	18	41.39 /mh	745	-	-	-	-	9.17	55	-	-	800	1,267
				3000 psi Concrete	6 cy					138.00	828	-	-	-	-	-	-	828	1,257
				03.09 Pan Stair Fill	6 cy		41		1,639	138.00	828			9.17	55			2,522	3,939
			03.20	Precast Planks															
				Precast Hollow Core Roof Planks 4' wide x 10"	14,596 sf	0.020 mh / sf	292	42.24 /mh</											

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				06.00 Wood	1 ls		156		6,188	6,259.15	6,259							12,448	19,294
				07.00 Moisture Protection															
				Caulking @ Masonry Wall Joints- Exterior (.09 lf/sf)	1,349 lf			/lf				4.00	5,397					5,397	8,191
				Caulking @ Masonry Wall Joints- Interior	1,349 lf			/lf				4.00	5,397					5,397	8,191
				07.00 Moisture Protection	1 ls							10,794.17	10,794					10,794	16,382
				07.01 Roofing															
				Membrane Roofing- 60 mil EPDM Mechanically Attached w/ 3" Insulation	15,395 sf			/sf				3.00	46,194					46,194	70,110
				Aluminum Downspouts, 14 ea	280 lf			/lf				18.00	5,041					5,041	7,651
				Scuppers	14 ea			/ea				50.01	700					700	1,063
				Aluminum Coping @ Roof Parapet 12" wide	645 lf			/lf				15.00	9,677					9,677	14,687
				Roof Hatch 4'0" x 4'0"	1 ea			/ea				2,200.44	2,200					2,200	3,340
				07.01 Roofing	15,395 sf							4.15	63,813					63,813	96,850
				08.00 Doors, Frames & Hardware															
				HM Single Frames- 16 ga 3'x7'	8 ea	1.000 mh / ea	8	39.18 /mh	313	180.04	1,440							1,754	2,682
				HM Double Frames- 16 ga 6'x7'	3 ea	1.500 mh / ea	5	25.39 /mh	114	210.00	630							744	1,137
				HM Door Leafs- 3'x7' 20 ga. half glass	14 ea	1.500 ea / mh	9	39.18 /mh	366	450.09	6,301							6,667	10,142
				Overhead Doors- 10'x10' 24 ga steel manual 1" insulation 26 ga back-up panel	2 ea							2,255.00	4,510					4,510	6,845
				Finish Hardware by Leaf- Allowance	14 ea	8.002 mh / ea	112	39.18 /mh	4,389	900.18	12,603							16,991	26,073
				08.00 Doors, Frames & Hardware	16 ea		134		5,182	1,310.88	20,974	281.88	4,510					30,666	46,879
				09.00 Finishes															
				Paint HM Door Frames - primer (2) coats	11 ea			/ea				100.02	1,100					1,100	1,670
				Paint HM Doors - primer (2) coats	14 ea			/ea				140.03	1,960					1,960	2,975
				Paint CMU Block - block filler & (2) coat	28,958 sf							1.35	39,093					39,093	59,333
				Paint 2" Pipe	194 lf	0.035 mh / lf	7	27.53 /mh	187	0.23	45			2.12	411			643	1,018
				Paint 6" Pipe	373 lf	0.070 mh / lf	26	27.53 /mh	719	0.69	258			4.24	1,581			2,558	4,046
				Paint 12" Pipe	53 lf	0.120 mh / lf	6	27.53 /mh	175	1.39	73			5.65	300			598	865
				Paint 16" Pipe	340 lf	0.140 mh / lf	48	27.53 /mh	1,311	1.85	628			6.06	2,059			3,487	6,304
				Paint 20" Pipe	0 lf	0.300 mh / lf	0	27.53 /mh	0	2.00	0			7.00	0			0	0
				Paint 24" Pipe	203 lf	0.350 mh / lf	71	27.53 /mh	1,956	2.77	562			7.07	1,434			3,953	6,232
				Paint 30" Pipe	154 lf	0.438 mh / lf	67	27.53 /mh	1,855	3.46	533			4.12	635			3,023	4,755
				Paint 72" Pipe	183 lf	0.525 mh / lf	96	27.53 /mh	2,645	8.31	1,520			4.95	905			5,071	7,935
				09.00 Finishes	1 ls		321		8,848	3,619.94	3,620	42,153.90	42,154	7,324.45	7,324			61,946	95,133
				10.00 Specialty Items															
				Signs - Building ID	1 ea			/ea				3,000.60	3,001					3,001	4,554
				Signs - Doors	11 ea			/ea				30.01	330					330	501
				Fire Extinguisher CO2 10 lbs	12 ea			/ea				225.05	2,701					2,701	4,099
				10.00 Specialty Items	1 ls							6,031.22	6,031					6,031	9,154
				22.00 Plumbing															
				Plumbing Subcontract	15,395 sf			/sf				4.00	61,592					61,592	93,480
				22.00 Plumbing	1 ls							61,592.30	61,592					61,592	93,480
				23.00 HVAC															
				Ventilation & Unit Heater System	15,395 sf			/sf				45.00	692,775					692,775	1,051,435
				23.00 HVAC	15,395 sf							45.00	692,775					692,775	1,051,435
				31.01 Dewatering															
				Dewatering - Well Point System Installation	1 sys	240.048 ch / sys	960	159.35 /ch	38,251	7,501.50	7,502			33,599.22	33,599			79,352	125,400
				Dewatering - Well Point System Monthly Rental	4 mo	13.288 mh / mo	53	39.17 /mh	2,082	5,704.89	22,820			22,004.39	88,018			112,919	178,010
				Dewatering - Well Point System Removal	1 sys	60.012 ch / sys	240	159.35 /ch	9,563	2,500.50	2,501			8,399.94	8,400			20,463	32,299
				31.01 Dewatering	1 ls		1,253		49,896	32,821.55	32,822			130,016.73	130,017			212,734	335,708
				31.02 Piles															
				Augered Piles CIP 18" x @ 25 ft depth, 10' oc = 184 ea (1 per 77 sf)	4,600 vf	0.002 cd / vf	515	2,146.97 /cd	19,756	35.16	161,720			2.58	11,869			193,345	295,603
				31.02 Piles	184 ea		515		19,756	878.91	161,720			64.51	11,869			193,345	295,603
				31.03 Excavation Shoring															
				Shoring System Design Engineer	1 ls							15,003.00	15,003					15,003	22,770
				Structure Sheeting (557' x 28' deep)	15,596 sf	0.001 cd / sf	769	2,465.38 /cd	29,614	16.00	249,586			0.75	11,729			290,930	444,339
				Tie Backs (1 per 80 sf of Sheeting, 557' x 21' = 11,697 sf)	146 ea							2,377.48	347,111					347,111	526,816
				31.03 Excavation Shoring	15,596 sf		769		29,614	16.00	249,586	23.22	362,114	0.75	11,729			653,044	993,925
				31.10 Structure Excavation															
				Exc Clay-Backhoe/Truck (16,774 sf x 21')	13,047 cy	499.900 cy / cd	940	1,410.06 /cd	36,801					6.58	85,902			122,703	194,960
				31.10 Structure Excavation	13,047 cy		940		36,801					6.58	85,902			122,703	194,960
				31.12 Structure Backfill															
				Backfill Earth-Backhoe/Truck	2,479 cy	495.000 cy / cd	160	1,327.72 /cd	6,649					4.69	11,618			18,268	29,015
				31.12 Structure Backfill	2,479 cy		160		6,649					4.69	11,618			18,268	29,015
				31.13 Soil Disposal															
				Spoils to Waste	10,568 cy	0.003 day / cy	951	1,410.06 /day	37,261					8.23	86,975			124,236	197,396
				31.13 Soil Disposal	10,568 cy		951		37,261					8.23	86,975			124,236	197,396
				31.20 Structure Stone Base															
				Structure Subbase Stone-Loaders/Truck - 14,128 sf x 6"	262 cy	0.003 cd / cy	32	1,609.56 /cd	1,278	28.28	7,410			10.02	2,624			11,312	17,444
				31.20 Structure Stone Base	262 cy		32		1,278	28.28	7,410			10.02	2,624			11,312	17,444
				00 Building & Structure Construction	15,395 gsf		30,172		1,207,659	97.93	1,507,669	115.11	1,772,142	24.14	371,610			4,859,081	7,480,625
				26 Electrical & Instrumentation															
				26.00 UG Electrical															
				UG Electrical System	15,395 sf			/sf				16.00	246,369					246,369	373,918
				26.00 UG Electrical	1 ls														

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			40.00	Under Ground Process Piping																
				Hydrostatic Testing	491 lf	0.021 ch / lf	41	182.49 /ch	1,882	0.16	79	-	-	-	-	-	-	1,961	3,098	
				40.00 Under Ground Process Piping	491 lf		287		14,075	101.26	49,719			1.88	925			64,719	99,208	
			40.01	Above Ground Process Piping																
				Paint & Stencil Exposed Piping <20"	960 lf	-	-	-	-	-	-	10.00	9,602	-	-	-	-	9,602	14,573	
				Paint & Stencil Exposed Piping >20"	540 lf	-	-	-	-	-	-	25.01	13,503	-	-	-	-	13,503	20,493	
				Pipe Supports	24 ea	4.001 mh / ea	96	45.62 /mh	4,381	250.05	6,001	-	-	-	-	-	-	10,382	16,041	
				Hydrostatic Testing	1,500 lf	0.021 ch / lf	126	182.49 /ch	5,749	0.16	240	-	-	-	-	-	-	5,990	9,464	
				Dresser Couplings 42"	6 ea	24.000 mh / ea	144	40.79 /mh	5,873	3,500.00	21,000	-	-	-	-	-	-	26,873	41,168	
				Dressler Couplings 72"	18 ea	36.000 mh / ea	648	40.79 /mh	26,429	6,000.00	108,000	-	-	-	-	-	-	134,429	205,743	
				12" DI Wall Thimble 24" long	12 ea	1.250 ch / ea	60	182.49 /ch	2,737	430.09	5,161	-	-	301.00	3,612	-	-	11,510	17,914	
				16" DI Wall Thimble 24" long	12 ea	1.670 ch / ea	80	182.49 /ch	3,657	575.00	6,900	-	-	402.14	4,826	-	-	15,383	23,940	
				20" DI Wall Thimble 24" long	12 ea	2.500 ch / ea	120	182.49 /ch	5,475	733.00	8,796	-	-	900.35	10,804	-	-	25,075	39,210	
				24" DI Wall Thimble 24" long	12 ea	2.500 ch / ea	120	182.49 /ch	5,475	860.00	10,320	-	-	1,200.24	14,403	-	-	30,198	47,250	
				72" DI Wall Thimble 24" long	2 ea	10.000 ch / ea	80	182.49 /ch	3,650	2,600.00	5,200	-	-	1,600.00	3,200	-	-	12,050	18,762	
				Gasket/Nuts/Bolt Kit 6"	38 ea	1.000 mh / ea	38	32.89 /mh	1,250	15.87	603	-	-	-	-	-	-	1,853	2,894	
				Gasket/Nuts/Bolt Kit 12"	5 ea	1.000 mh / ea	5	45.62 /mh	228	45.01	225	-	-	-	-	-	-	453	703	
				Gasket/Nuts/Bolt Kit 16"	34 ea	1.000 mh / ea	34	32.89 /mh	1,118	46.64	1,586	-	-	-	-	-	-	2,704	4,177	
				Gasket/Nuts/Bolt Kit 24"	20 ea	2.000 mh / ea	40	45.62 /mh	1,825	129.48	2,590	-	-	-	-	-	-	4,415	6,819	
				Gasket/Nuts/Bolt Kit 30"	16 ea	1.000 mh / ea	16	32.89 /mh	526	175.00	2,800	-	-	-	-	-	-	3,326	5,083	
				DI Flanged Joint Pipe 2"	194 lf	0.820 mh / lf	159	30.57 /mh	4,863	30.99	6,011	-	-	-	-	-	-	10,874	16,819	
				DI Flanged Joint Pipe 6"	373 lf	0.900 mh / lf	336	30.57 /mh	10,261	47.39	17,675	-	-	-	-	-	-	27,936	43,066	
				DI Flanged Joint Pipe 12"	53 lf	1.890 mh / lf	100	45.62 /mh	4,571	112.94	5,986	-	-	-	-	-	-	10,557	16,319	
				DI Flanged Joint Pipe 16"	340 lf	2.170 mh / lf	738	30.57 /mh	22,552	162.43	55,226	-	-	-	-	-	-	77,778	119,510	
				DI Flanged Joint Pipe 24"	203 lf	2.671 mh / lf	542	45.62 /mh	24,732	267.89	54,381	-	-	-	-	-	-	79,114	121,679	
				DI Flanged Joint Pipe 30"	154 lf	3.050 mh / lf	470	30.57 /mh	14,357	310.14	47,762	-	-	-	-	-	-	62,119	95,213	
				DI Flanged Joint Pipe 72"	183 lf	6.600 mh / lf	1,208	30.57 /mh	36,919	1,431.91	262,040	-	-	-	-	-	-	298,958	456,133	
				DI Flanged 90 ell 16"	35 ea	12.680 mh / ea	444	30.57 /mh	13,566	599.40	20,979	-	-	-	-	-	-	34,545	53,311	
				DI Flanged 90 ell 20"	23 ea	14.650 mh / ea	337	30.57 /mh	10,299	939.60	21,611	-	-	-	-	-	-	31,910	49,100	
				DI Flanged 90 ell 24"	24 ea	15.730 mh / ea	378	30.57 /mh	11,540	1,458.00	34,992	-	-	-	-	-	-	46,532	71,372	
				DI Flanged 90 ell 30"	47 ea	17.870 mh / ea	840	30.57 /mh	25,673	2,316.60	108,880	-	-	-	-	-	-	134,553	205,882	
				DI Flanged Tee 12"	12 ea	11.012 mh / ea	132	45.62 /mh	6,029	777.86	9,334	-	-	-	-	-	-	15,363	23,709	
				DI Flanged Tee 16"	12 ea	12.680 mh / ea	152	30.57 /mh	4,651	0.00	0	-	-	-	-	-	-	4,651	7,361	
				DI Flanged Tee 30"	22 ea	17.874 mh / ea	393	45.62 /mh	17,940	0.00	0	-	-	-	-	-	-	17,940	28,394	
				DI Flanged Cross 72"	6 ea	72.000 mh / ea	432	30.57 /mh	13,205	39,000.00	234,000	-	-	-	-	-	-	247,205	376,045	
				DI Flanged Con Red 16x12"	12 ea	12.680 mh / ea	152	30.57 /mh	4,651	890.40	10,685	-	-	-	-	-	-	15,336	23,578	
				DI Flanged Con Red 30x16"	12 ea	17.870 mh / ea	214	30.57 /mh	6,555	2,721.60	32,659	-	-	-	-	-	-	39,214	59,942	
				DI Flanged Con Red 36x30"	2 ea	20.520 mh / ea	41	30.57 /mh	1,254	5,224.80	10,450	-	-	-	-	-	-	11,704	17,845	
				DI Blind Flange 48"	0 ea	23.590 mh / ea	0	30.57 /mh	0	7,186.00	72	-	-	-	-	-	-	79	120	
				Misc Piping & Accessories- ALLOWANCE	500 LF	0.240 mh / LF	120	45.62 /mh	5,476	55.01	27,505	-	-	-	-	-	-	32,981	50,412	
				40.01 Above Ground Process Piping	1,500 lf		8,795		307,474	759.78	1,139,670	15.40	23,105	24.56	36,845			1,507,093	2,310,044	
			40.02	Valves, Meters, Etc.																
				Water Solenoid Valve	12 ea	0.400 mh / ea	5	28.04 /mh	135	4,000.00	48,000	-	-	-	-	-	-	48,135	73,063	
				Magnetic Flow Meter - In-line - 24" w/ transmitter	12 ea	26.000 mh / ea	312	43.67 /mh	13,626	12,000.00	144,000	-	-	-	-	-	-	157,626	240,117	
				12" Butterfly Valve, 125 lb class, CI Body, Fig. w/ EIM elec actuator NEMA 4	24 ea	9.600 mh / ea	230	30.57 /mh	7,043	13,040.00	312,960	-	-	-	-	-	-	320,003	486,131	
				18" Butterfly Valve, 125 lb class, CI Body, Fig. w/ EIM elec actuator NEMA 4	12 ea	14.400 mh / ea	173	30.57 /mh	5,282	8,550.00	102,600	-	-	-	-	-	-	107,882	164,077	
				30" Butterfly Valve, 125 lb class, CI Body, Fig. w/ EIM elec actuator NEMA 4	8 ea	24.000 mh / ea	192	30.57 /mh	5,869	16,484.00	131,872	-	-	-	-	-	-	137,741	209,433	
				42" Butterfly Valve, 75 lb class, CI Body, Fig. w/ EIM elec actuator NEMA 4	1 ea	33.600 mh / ea	34	30.57 /mh	1,027	23,078.00	23,078	-	-	-	-	-	-	24,105	36,651	
				40.02 Valves, Meters, Etc.	1 ls		946		32,981	762,510.00	762,510							795,491	1,209,472	
			40.04	Hydropneumatic Piping System																
				Hydropneumatic Piping, Fitting & Valve Allowance	1 ls	mh / ls		45.62 /mh				38,000.00	38,000					38,000	57,673	
				40.04 Hydropneumatic Piping System	1 ls							38,000.00	38,000					38,000	57,673	
				40 Process Piping	1,991 lf		10,028		354,530	980.36	1,951,898	30.69	61,105	18.97	37,770			2,405,303	3,676,398	
			41	Material Handling & Process Equipment																
			41.22	Hoists & Cranes																
				Steel Bracket @ Column To Support Crane Rail Beam	28 ea	0.200 mh / ea	6	42.40 /mh	237	726.47	20,341	-	-	-	-	-	-	20,578	31,248	
				W 18 x 156 Crane Rail Beam	700 lf	-	-	-	-	83.46	58,422	-	-	-	-	-	-	58,422	88,668	
				Erect Steel W 18 x 156 Beams (29' long)	24 ea	5.000 ch / ea	600	197.59 /ch	23,711	-	-	-	-	518.13	12,435	-	-	36,146	57,318	
				Bridge Crane 5 ton 26 ft span, 175 ft runway beam	2 ea	-	-	-	-	-	-	-	-	-	-	160,000.00	320,000	320,000	485,669	
				41.22 Hoists & Cranes			606		23,948		78,763				12,435		320,000	435,147	662,903	
				41 Material Handling & Process Equipment	1 ls		606		23,948	78,763.05	78,763			12,435.00	12,435	320,000.00	320,000	435,147	662,903	
			43	Process Equipment																
			43.11	Membrane Filtration Equipment																
				Filter Equipment Start-Up @ Basins	24 ea	75.000 ch / ea	12,600	350.77 /ch	631,379	2,500.00	60,000	-	-	-	-	-	-	691,379	1,090,356	
				Suez- ZeeWeed Ultrafiltration Membrane System	1 ls	-	-	/ls	-	-	-	-	-	18,594,595.00	18,594,595	18,594,595	18,594,595	28,221,307		
				Install TripleStack Cassette 18' long w/144 Modules/Cassette @ (12) Basins	72 ea	9.000 mh / ea	648	30.57 /mh	19,807	-	-	-	-							

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04				Chlorine															
	4A			Chlorine - Replace Chlorine Gas Equipment															
		00		Building & Structure Construction															
			03.03	Columns															
				Form Rectangle Columns 15' h	720 sf	0.165 mh / sf	119	39.49 /mh	4,691	1.60	1,149	-	-	-	-	-	-	5,841	9,169
				Chamfer	480 lf	0.015 mh / lf	7	39.49 /mh	284	0.57	272	-	-	-	-	-	-	557	863
				Strip & Oil Column Form	720 sf	0.005 mh / sf	4	39.17 /mh	141	0.03	22	-	-	-	-	-	-	163	256
				Superplasticizers @ Columns	10 cy					8.40	84	-	-	-	-	-	-	84	128
				Column Rebar (120 #/cy)	1 tn	20.004 mh / tn	12	43.53 /mh	522	997.70	599	-	-	-	-	-	-	1,121	1,735
				Finish- Float	66 sf	0.017 mh / sf	1	39.17 /mh	44	-	-	-	-	-	-	-	-	44	70
				Pump Place Columns 8 ea	10 cy	1.600 mh / cy	16	41.39 /mh	662	-	-	-	-	7.50	75	-	-	737	1,168
				4000 psi Concrete	10 cy					142.00	1,420	-	-	-	-	-	-	1,420	2,155
				Grind/Patch Columns	720 sf	0.013 mh / sf	9	39.17 /mh	367	0.03	22	-	-	-	-	-	-	388	613
				Rub Columns	720 sf	0.065 mh / sf	47	39.17 /mh	1,833	0.06	43	-	-	-	-	-	-	1,876	2,967
				Liquid Curing Compounds	720 sf	0.003 mh / sf	2	39.17 /mh	85	0.06	42	-	-	-	-	-	-	127	198
				03.03 Columns	10 cy		217		8,630	365.30	3,653			7.50	75			12,357	19,322
			03.05	Slab On Grade															
				Slab Edge Form 30"	378 sf	0.350 mh / sf	132	39.49 /mh	5,225	1.31	496	-	-	-	-	-	-	5,722	9,023
				Rebar- SOG (125 #/cy)	8 tn	14.003 mh / tn	112	43.53 /mh	4,876	997.70	7,982	-	-	-	-	-	-	12,858	19,831
				Mesh Support - bricks (12/sf)	165 ea	0.002 mh / ea	0	43.53 /mh	14	0.26	43	-	-	-	-	-	-	58	89
				Finish- Hard Trowel	1,372 sf	0.015 mh / sf	21	39.17 /mh	806	-	-	-	-	-	-	-	-	806	1,276
				Pump Place Slab on Grade 30"	128 cy	0.500 mh / cy	64	41.39 /mh	2,649	-	-	-	-	3.67	470	-	-	3,119	4,941
				4000 psi Concrete	128 cy					142.00	18,176	-	-	-	-	-	-	18,176	27,586
				Liquid Curing Compounds	1,750 sf	0.002 mh / sf	4	39.17 /mh	137	0.06	103	-	-	-	-	-	-	240	373
				Seal Floors	1,372 sf	0.002 mh / sf	3	39.17 /mh	108	0.09	127	-	-	-	-	-	-	234	363
				6 Mil. Vapor Barrier	1,500 sf	0.002 mh / sf	3	43.53 /mh	131	0.05	79	-	-	-	-	-	-	209	326
				Gravel Fill Under Slab 4"	17 cy	0.004 cd / cy	2	1,412.15 /cd	91	29.26	497	-	-	3.84	65	-	-	654	1,003
				03.05 Slab On Grade	128 cy		341		14,038	214.87	27,503			4.18	535			42,076	64,811
			03.07	Suspended Beams															
				Beam Side Forms	776 sf	0.210 mh / sf	163	39.49 /mh	6,436	2.21	1,711	-	-	-	-	-	-	8,148	12,784
				Beam Bottom Forms	291 sf	0.210 mh / sf	61	39.49 /mh	2,414	2.21	642	-	-	-	-	-	-	3,055	4,794
				Chamfer	388 lf	0.015 mh / lf	6	39.49 /mh	230	0.57	220	-	-	-	-	-	-	450	698
				Strip & Oil Beam Forms	1,067 sf	0.005 mh / sf	5	39.17 /mh	209	0.03	32	-	-	-	-	-	-	241	379
				Superplasticizers @ Beams	22 cy					8.40	185	-	-	-	-	-	-	185	281
				Rebar- Beams (250 #/cy)	3 tn	15.003 mh / tn	41	43.53 /mh	1,796	997.70	2,744	-	-	-	-	-	-	4,540	7,006
				Finish- Top of Beam	281 sf	0.008 mh / sf	2	39.17 /mh	88	-	-	-	-	-	-	-	-	88	139
				Pump Place Beams @ Roof	22 cy	2.001 mh / cy	44	41.39 /mh	1,822	-	-	-	-	14.42	317	-	-	2,139	3,389
				4000 psi Concrete	22 cy					142.00	3,124	-	-	-	-	-	-	3,124	4,741
				Grind/Patch Beams	1,067 sf	0.013 mh / sf	14	39.17 /mh	543	0.03	32	-	-	-	-	-	-	575	909
				Rub Beams	1,067 sf	0.085 mh / sf	91	39.17 /mh	3,552	0.06	64	-	-	-	-	-	-	3,616	5,719
				Liquid Curing Compounds	1,067 sf	0.002 mh / sf	2	39.17 /mh	84	0.06	63	-	-	-	-	-	-	146	228
				03.07 Suspended Beams	22 cy		430		17,174	400.75	8,817			14.42	317			26,308	41,067
			03.20	Precast Planks															
				Precast Hollow Core Roof Planks 4' wide x 10"	1,283 sf	0.020 mh / sf	26	42.24 /mh	1,084	8.80	11,293	-	-	0.35	452	-	-	12,828	19,573
				03.20 Precast Planks	1,283 sf		26		1,084	8.80	11,293			0.35	452			12,828	19,573
			04.00	Masonry															
				8' CMU + Rigid Insulation Backup To Brick, 22' h	2,820 sf			/sf	-	-	-	18.00	50,760	-	-	-	-	50,760	77,039
				Precast Cap 16" x 4"	145 lf			/lf	-	-	-	20.00	2,901	-	-	-	-	2,901	4,402
				Brick Veneer	3,480 sf				-	-	-	9.00	31,326	-	-	-	-	31,326	47,544
				04.00 Masonry	3,480 sf							24.42	84,987					84,987	128,986
			05.02	FRP Items															
				FRP Stairs Grating Type Treads, 7 ea	0 rs	1.000 mh / rs	0	42.08 /mh	0	368.00	4	-	-	-	-	-	-	4	6
				FRP Stairs Grating Landing 4' x 4' w/ Support Frame, 7 ea	0 ea	4.001 mh / ea	0	42.08 /mh	2	1,000.00	10	-	-	-	-	-	-	12	18
				FRP Feed Pump Tables 6' x 2.5' x 3' h	0 ea	1.500 mh / ea	0	42.08 /mh	1	940.00	9	-	-	-	-	-	-	10	15
				FRP 2 Line Safety Rail @ Pit Stairs, 7 ea	0 lf	0.200 mh / lf	0	42.08 /mh	0	32.00	0	-	-	-	-	-	-	0	1
				05.02 FRP Items	1 ls		0		3	23.40	23							26	40
			06.00	Wood															
				Misc Nailers & Blocking	1,372 sf	0.010 mh / sf	14	39.67 /mh	544	0.40	551	-	-	-	-	-	-	1,095	1,697
				06.00 Wood	1 ls		14		544	550.63	551							1,095	1,697
			07.00	Moisture Protection															
				Caulking @ Masonry Wall Joints- Exterior (.09 lf/sf)	313 lf			/lf	-	-	-	4.00	1,252	-	-	-	-	1,252	1,901
				Caulking @ Masonry Wall Joints- Interior	313 lf			/lf	-	-	-	4.00	1,252	-	-	-	-	1,252	1,901
				07.00 Moisture Protection	1 ls							2,504.50	2,505					2,505	3,801
			07.01	Roofing															
				Membrane Roofing- 60 mil EPDM Mechanically Attached w/ 3" Insulation	1,372 sf			/sf	-	-	-	3.00	4,117	-	-	-	-	4,117	6,248
				Aluminum Downspouts, 2 ea x 20' each	40 vf			/vf	-	-	-	18.00	720	-	-	-	-	720	1,093
				07.01 Roofing	1,372 sf							3.53	4,837					4,837	7,341
			08.00	Doors, Frames & Hardware															
				FRP Single Door Frames- 16 ga 3'x8'	2 ea	1.000 mh / ea	2	39.18 /mh	78	350.07	700	-	-	-	-	-	-	779	1,187
				FRP Door Leafs- 3'x7' 20 ga. flush w/ Half Glass	2 ea	1.500 mh / ea	3	39.18 /mh	118	850.17	1,700	-	-	-	-	-	-	1,818	2,767
				Overhead Doors- 12'x12' 24 ga steel manual 1" insulation 26 ga back-up panel	2 ea				-	-	-	3,800.00	7,600	-	-	-	-	7,600	11,535
				FRP Framed Windows 14' x 15' h, 2 ea	420 sf				-	-	-	105.02	44,109	-	-	-	-	44,109	66,945
				Install Hardware by Leaf- Allowance	2 ea	8.002 mh / ea	16	39.18 /mh	627	-	-	-	-	-	-	-	-	627	992
				Finish Hardware @ FRP Doors	2 ea			/ea	-	1,250.25	2,501	-	-	-	-	-	-	2,501	

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			03.07	Suspended Beams															
				Rebar- Beams (250 #/cy)	4 tn	15.003 mh / tn	60	43.53 /mh	2,612	997.70	3,991	-	-	-	-	-	-	6,603	10,191
				Finish- Top of Beam	414 sf	0.008 mh / sf	3	39.17 /mh	130	-	-	-	-	-	-	-	-	130	205
				Pump Place Beams @ Roof	31 cy	2.001 mh / cy	62	41.39 /mh	2,567	-	-	-	-	14.42	447	-	-	3,014	4,775
				4000 psi Concrete	31 cy			/cy		142.00	4,402	-	-	-	-	-	-	4,402	6,681
				Grind/Patch Beams	1,517 sf	0.013 mh / sf	20	39.17 /mh	773	0.03	46	-	-	-	-	-	-	818	1,292
				Rub Beams	1,517 sf	0.085 mh / sf	129	39.17 /mh	5,050	0.06	91	-	-	-	-	-	-	5,141	8,131
				Liquid Curing Compounds	1,931 sf	0.002 mh / sf	4	39.17 /mh	151	0.06	114	-	-	-	-	-	-	265	412
				03.07 Suspended Beams	31 cy		612		24,490	406.70	12,608			14.42	447			37,545	58,607
			03.08	Pads & Curbs															
				Pad Form	150 sf	0.120 mh / sf	18	39.49 /mh	711	1.37	205	-	-	-	-	-	-	916	1,436
				Chamfer	150 lf	0.015 mh / lf	2	39.49 /mh	89	0.57	85	-	-	-	-	-	-	174	270
				Strip & Oil Equipment Pad Forms	150 sf	0.005 mh / sf	1	39.17 /mh	29	0.03	5	-	-	-	-	-	-	34	53
				Rebar- Pads (100 #/cy)	1 tn	18.003 mh / tn	18	43.53 /mh	784	997.70	998	-	-	-	-	-	-	1,781	2,754
				Finish- Float	444 sf	0.017 mh / sf	8	39.17 /mh	296	-	-	-	-	-	-	-	-	296	468
				Pump Place Pads	16 cy	1.601 mh / cy	26	41.39 /mh	1,060	-	-	-	-	7.49	120	-	-	1,180	1,868
				4000 psi Concrete	16 cy			/cy		142.00	2,272	-	-	-	-	-	-	2,272	3,448
				Liquid Curing Compounds	594 sf	0.003 mh / sf	2	39.17 /mh	70	0.06	35	-	-	-	-	-	-	105	164
				03.08 Pads & Curbs	16 cy		74		3,038	224.94	3,599			7.49	120			6,757	10,461
			03.20	Precast Planks															
				Precast Hollow Core Roof Planks 4' wide x 10"	1,726 sf	0.020 mh / sf	35	42.24 /mh	1,458	8.80	15,192	-	-	0.35	607	-	-	17,258	26,332
				03.20 Precast Planks	1,726 sf		35		1,458	8.80	15,192			0.35	607			17,258	26,332
			04.00	Masonry															
				8' CMU + Rigid Insulation Backup To Brick, 22' h	3,190 sf			/sf		-	-	18.00	57,420	-	-	-	-	57,420	87,147
				Precast Cap 16" x 4"	164 lf			/lf		-	-	20.00	3,281	-	-	-	-	3,281	4,979
				Brick Veneer	3,938 sf					-	-	9.00	35,449	-	-	-	-	35,449	53,802
				04.00 Masonry	3,938 sf							24.42	96,150					96,150	145,928
			05.02	FRP Items															
				FRP Stairs Grating Type Treads, 7 ea	10 rs	1.000 mh / rs	10	42.08 /mh	421	367.57	3,676	-	-	-	-	-	-	4,097	6,245
				FRP Grating w/ Support Frame	522 SF	0.250 mh / SF	131	42.08 /mh	5,492	63.00	32,886	-	-	-	-	-	-	38,378	58,603
				FRP 2 Line Safety Rail	127 lf	0.200 mh / lf	25	42.08 /mh	1,069	32.21	4,090	-	-	-	-	-	-	5,159	7,900
				05.02 FRP Items	1 ls		166		6,982	40,651.95	40,652							47,634	72,748
			06.00	Wood															
				Misc Nailers & Blocking	1,819 sf	0.010 mh / sf	18	39.67 /mh	722	0.40	730	-	-	-	-	-	-	1,452	2,250
				06.00 Wood	1 ls		18		722	730.02	730							1,452	2,250
			07.00	Moisture Protection															
				Caulking @ Masonry Wall Joints- Exterior (.09 lf/sf)	354 lf			/lf				4.00	1,416	-	-	-	-	1,416	2,150
				Caulking @ Masonry Wall Joints- Interior	354 lf			/lf				4.00	1,416	-	-	-	-	1,416	2,149
				07.00 Moisture Protection	1 ls							2,832.56	2,833					2,833	4,299
			07.01	Roofing															
				Membrane Roofing- 60 mil EPDM Mechanically Attached w/ 3" Insulation	1,819 sf			/sf				3.00	5,458	-	-	-	-	5,458	8,284
				Aluminum Downspouts, 2 ea x 20' each	40 vf			/vf				18.00	720	-	-	-	-	720	1,093
				07.01 Roofing	1,819 sf							3.40	6,178					6,178	9,377
			08.00	Doors, Frames & Hardware															
				FRP Single Door Frames- 16 ga 3'x8'	1 ea	1.000 mh / ea	1	39.18 /mh	39	350.07	350	-	-	-	-	-	-	389	593
				FRP Double Door Frames- 16 ga 3'x8'	2 ea	1.250 mh / ea	3	39.18 /mh	98	650.13	1,300	-	-	-	-	-	-	1,398	2,128
				FRP Door Leafs- 3'x7' 20 ga. flush w/ Half Glass	5 ea	1.500 mh / ea	8	39.18 /mh	294	850.17	4,251	-	-	-	-	-	-	4,545	6,917
				Overhead Doors- 14'x14' 24 ga steel chain hoist 1" insulation 26 ga back-up panel	2 ea							5,975.00	11,950	-	-	-	-	11,950	18,137
				FRP Framed Windows 14' x 15' h, 2 ea	420 sf							105.02	44,109	-	-	-	-	44,109	66,945
				Install Hardware by Leaf- Allowance	5 ea	8.002 mh / ea	40	39.18 /mh	1,567	-	-	-	-	-	-	-	-	1,567	2,481
				Finish Hardware @ FRP Doors	5 ea			/ea		1,250.25	6,251	-	-	-	-	-	-	6,251	9,488
				08.00 Doors, Frames & Hardware	7 ea		51		1,998	1,736.06	12,152	8,008.40	56,059					70,210	106,688
			09.00	Finishes															
				Paint Door Frames - primer (2) coats	3 ea			/ea				100.02	300	-	-	-	-	300	455
				Paint Doors - primer (2) coats	5 ea			/ea				140.03	700	-	-	-	-	700	1,063
				Paint Block Walls w/ Epoxy Coating	3,190 sf			/sf				2.50	7,977	-	-	-	-	7,977	12,106
				Epoxy Coating On Floor & Curbs	1,819 sf							4.50	8,187	-	-	-	-	8,187	12,426
				09.00 Finishes	1 ls							17,163.92	17,164					17,164	26,050
			10.00	Specialty Items															
				Signs - Building ID	1 ea			/ea				3,000.60	3,001	-	-	-	-	3,001	4,554
				Signs - Doors	3 ea			/ea				30.01	90	-	-	-	-	90	137
				Fire Extinguisher CO2 10 lbs	2 ea			/ea				225.05	450	-	-	-	-	450	683
				10.00 Specialty Items	1 ls							3,540.71	3,541					3,541	5,374
			21.00	Fire Protection (Wet System)															
				Tap Onto Water Main to Provide Separate Water Feed for Suppression System	1 ea			/ea				2,000.40	2,000	-	-	-	-	2,000	3,036
				Flow Test	1 ea			/ea				1,000.20	1,000	-	-	-	-	1,000	1,518
				Post Indicator Valve & Backflow Preventer	1 ea			/ea				5,001.00	5,001	-	-	-	-	5,001	7,590
				Wet Pipe Fire Protection System	1,372 sf			/sf				8.00	10,978	-	-	-	-	10,978	16,662
				Testing of Fire Protection System	1,372 sf			/sf				2.00	2,745	-	-	-	-	2,745	4,165
				21.00 Fire Protection (Wet System)	1,372 sf							15.83	21,724					21,724	32,971
			22.00	Plumbing															
				Plumbing Subcontract	1,819 sf			/sf				11.00	20,009	-	-	-	-	20,009	30,368
				22.00 Plumbing	1 ls							20,009.00	20,009					20,009	30,368
			23.00	HVAC															

WBS Lvl 1	WBS Lvl 2	WBS Lvl 3	WBS Lvl 4	Description	Takeoff Quantity	Labor Productivity	Man Hours	Labor Price	Labor Amount	Material Cost/Unit	Material Amount	Subcontract Cost/Unit	Subcontract Amount	Const Equip Cost/Unit	Const Equip Amount	Process Equip Cost/Unit	Process Equip Amount	Total Amount	Grand Total Amount
			26.01	Above Ground Electrical															
				Process Electrical System	1,819 sf	/sf						60.01	109,162					109,162	165,677
				26.01 Above Ground Electrical	1 ls							138,271.60	138,272					138,272	209,857
			26.02	Instrumentation & Controls															
				Controls & Instrumentation	1 ls	/ls						94,224.00	94,224					94,224	143,005
				26.02 Instrumentation & Controls	1 ls							94,224.00	94,224					94,224	143,005
				26 Electrical & Instrumentation	1 ls		25		1,138	272.00	272	261,605.41	261,605	500.00	500			263,516	400,053
		40		Process Piping															
			40.01	Above Ground Process Piping															
				Chlorine Piping & Accessories	200 LF	0.240 mh / LF	48	45.62 /mh	2,190	55.01	11,002	-	-	-	-	-	-	13,192	20,165
				Motive Water Supply Piping & Accessories	200 LF	0.240 mh / LF	48	45.62 /mh	2,190	55.01	11,002	-	-	-	-	-	-	13,192	20,165
				40.01 Above Ground Process Piping	400 lf		96		4,381	55.01	22,004							26,385	40,330
				40 Process Piping	400 lf		96		4,381	55.01	22,004							26,385	40,330
		43		Process Equipment															
			43.00	Pumps															
				Transfer Pumps 3 hp, 100 gpm	4 ea	35.000 mh / ea	140	47.77 /mh	6,688	1,500.30	6,001	-	-	-	-	20,000.00	80,000	92,690	141,111
				Softened Water Pumps < 1 hp, 65 gpm	4 ea	12.000 mh / ea	48	47.77 /mh	2,293	200.00	800	-	-	-	-	5,000.00	20,000	23,093	35,198
				Metering Pump	8 ea	10.000 mh / ea	80	34.45 /mh	2,756			-	-	-	-	2,448.00	19,584	22,340	34,084
				Hose Pumps	8 ea	10.000 mh / ea	80	34.45 /mh	2,756			-	-	-	-	19,500.00	156,000	158,756	241,125
				43.00 Pumps	1 ls		348		14,493	6,801.20	6,801					275,584.00	275,584	296,878	451,518
			43.13	Chemical System Equipment															
				Water Softner 100 GPM	4 ea	54.000 mh / ea	216	24.89 /mh	5,375			-	-	-	-	1,800.00	7,200	12,575	19,435
				Fiberglass Tanks 10,000 gal, 12' Diameter x 11.41' h Hydrochlorite)	1 ea	1,420 cd / ea	57	1,757.90 /cd	2,496			-	-	1,056.45	1,056	13,500.00	13,500	17,053	26,121
				Day Tank 5.67' diameter, 1000 gallon	3 ea	1.000 mh / ea	3	41.79 /mh	125			-	-	-	-	3,500.00	10,500	10,625	16,134
				Wall Mt Residual analyzer	4 ea	1.000 mh / ea	4	30.57 /mh	122			-	-	-	-	7,000.00	28,000	28,122	42,690
				Chlorine evaporator	4 ea	2.000 mh / ea	8	30.57 /mh	245			-	-	-	-	4,000.00	16,245	16,490	24,670
				Solution Panels 1"	2 ea	2.000 mh / ea	4	30.57 /mh	122			-	-	-	-	8,000.00	16,000	16,122	24,477
				Chlorine System Testing	1 ea	2.000 mh / ea	2	30.57 /mh	61			-	-	-	-	-	-	61	97
				Chlorine Leak Detector	4 ea	1.000 mh / ea	4	30.57 /mh	122			-	-	-	-	4,000.00	16,000	16,122	24,477
				Chlorine Gas Educators	4 ea	1.000 mh / ea	4	30.57 /mh	122			-	-	-	-	5,000.00	20,000	20,122	30,548
				Chlorine Scales	1 ea	1.000 mh / ea	1	30.57 /mh	31			-	-	-	-	6,000.00	6,000	6,031	9,155
				43.13 Chemical System Equipment	1 ls		303		8,822					1,056.45	1,056	133,200.00	133,200	143,079	217,804
				43 Process Equipment	1 ls		651		23,315	6,801.20	6,801			1,056.45	1,056	133,200.00	133,200	143,079	217,804
				4B Chlorine - Add New Liquid Hypochlorite Feed	1 ls		2,557		101,069	179,502.10	179,502	567,117.72	567,118	5,332.52	5,333	408,784.00	408,784	1,261,805	1,922,024
		4C		Chlorine - Add New Onsite Generation of Hypochlorite Facility															
		00		Building & Structure Construction															
			03.03	Columns															
				Form Rectangle Columns 15' h	1,350 sf	0.165 mh / sf	223	39.49 /mh	8,796	1.60	2,155	-	-	-	-	-	-	10,951	17,192
				Chamfer	900 lf	0.015 mh / lf	14	39.49 /mh	533	0.57	510	-	-	-	-	-	-	1,044	1,618
				Strip & Oil Column Form	1,350 sf	0.005 mh / sf	7	39.17 /mh	264	0.03	41	-	-	-	-	-	-	305	480
				Superplasticizers @ Columns	19 cy					8.40	160	-	-	-	-	-	-	160	242
				Column Rebar (120 #/cy)	1 tn	20.004 mh / tn	23	43.53 /mh	1,001	997.70	1,147	-	-	-	-	-	-	2,149	3,326
				Finish- Float	68 sf	0.017 mh / sf	1	39.17 /mh	45	-	-	-	-	-	-	-	-	45	72
				Pump Place Columns 15 ea	19 cy	1.600 mh / cy	30	41.39 /mh	1,258	-	-	-	-	7.50	142	-	-	1,401	2,218
				4000 psi Concrete	19 cy					142.00	2,698	-	-	-	-	-	-	2,698	4,095
				Grind/Patch Columns	1,350 sf	0.013 mh / sf	18	39.17 /mh	687	0.03	41	-	-	-	-	-	-	728	1,150
				Rub Columns	1,350 sf	0.065 mh / sf	88	39.17 /mh	3,437	0.06	81	-	-	-	-	-	-	3,518	5,563
				Liquid Curing Compounds	1,350 sf	0.003 mh / sf	4	39.17 /mh	159	0.06	79	-	-	-	-	-	-	238	372
				03.03 Columns	19 cy		407		16,182	363.78	6,912			7.50	142			23,236	36,328
			03.04	Walls															
				Keyway 6"	48 lf	0.050 mh / lf	2	39.49 /mh	95	0.67	32	-	-	-	-	-	-	127	199
				Job Built with Plyform 0-4'	383 sf	0.120 mh / sf	46	39.49 /mh	1,815	1.34	515	-	-	-	-	-	-	2,330	3,654
				Waterstop 6" Flat	48 lf	0.110 mh / lf	5	39.18 /mh	207	2.10	101	-	-	-	-	-	-	308	480
				Strip & Oil Wall Forms	383 sf	0.005 mh / sf	2	39.17 /mh	75	0.03	11	-	-	-	-	-	-	87	136
				Superplasticizers @ Walls	5 cy					8.40	42	-	-	-	-	-	-	42	64
				Rebar- Walls (125 #/cy)	0 tn	15.003 mh / tn	5	43.53 /mh	202	997.70	309	-	-	-	-	-	-	512	790
				Finish- Top of Wall	48 sf	0.008 mh / sf	0	39.17 /mh	15	-	-	-	-	-	-	-	-	15	24
				Pump Place Walls 12"	5 cy	1.150 mh / cy	6	41.39 /mh	238	-	-	-	-	6.65	33	-	-	271	430
				4000 psi Concrete	5 cy					142.00	710	-	-	-	-	-	-	710	1,078
				Grind/Patch Walls	383 sf	0.013 mh / sf	5	39.17 /mh	195	0.03	11	-	-	-	-	-	-	207	326
				Rub Walls	383 sf	0.058 mh / sf	22	39.17 /mh	870	0.06	23	-	-	-	-	-	-	893	1,412
				Liquid Curing Compounds	431 sf	0.002 mh / sf	1	39.17 /mh	34	0.06	25	-	-	-	-	-	-	59	92
				03.04 Walls	5 cy		94		3,746	356.09	1,780			6.65	33			5,560	8,684
			03.05	Slab On Grade															
				Slab Edge Form 30"	1,555 sf	0.350 mh / sf	544	39.49 /mh	21,496	1.31	2,041	-	-	-	-	-	-	23,537	37,120
				Rebar- SOG (125 #/cy)	13 tn	14.003 mh / tn	182	43.53 /mh	7,924	997.70	12,970	-	-	-	-	-	-	20,894	32,226
				Mesh Support - bricks (125/sf)	264 ea	0.002 mh / ea	1	43.53 /mh	23	0.26	69	-	-	-	-	-	-	92	142
				Finish- Hard Trowel	2,200 sf	0.015 mh / sf	33	39.17 /mh	1,293	-	-	-	-	-	-	-	-	1,293	2,046
				Pump Place Slab on Grade 30"	203 cy	0.500 mh / cy	102	41.39 /mh	4,202	-	-	-	-	3.67	745	-	-	4,947	7,836
				4000 psi Concrete	203 cy					142.00	28,826	-	-	-	-	-	-	28,826	43,750
				Liquid Curing Compounds	3,755 sf	0.002 mh / sf	8	39.17 /mh	294	0.06	221	-	-	-	-	-	-	515	801
				Seal Floors	2,200 sf	0.002 mh / sf	4	39.17 /mh	172	0.09	203	-	-	-	-	-	-	376	581
				6 Mil. Vapor Barrier</															

WBS Lvl 1	WBS Lvl 2	WBS Lvl 3	WBS Lvl 4	Description	Takeoff Quantity	Labor Productivity	Man Hours	Labor Price	Labor Amount	Material Cost/Unit	Material Amount	Subcontract Cost/Unit	Subcontract Amount	Const Equip Cost/Unit	Const Equip Amount	Process Equip Cost/Unit	Process Equip Amount	Total Amount	Grand Total Amount
			40.01	Above Ground Process Piping															
				Chlorine Piping & Accessories	300 LF	0.240 mh / LF	72	45.62 /mh	3,285	55.01	16,503	-	-	-	-	-	-	19,789	30,247
				Motive Water Supply Piping & Accessories	300 LF	0.240 mh / LF	72	45.62 /mh	3,285	55.01	16,503	-	-	-	-	-	-	19,789	30,247
				Brine Maker Piping & Accessories	300 LF	0.240 mh / LF	72	45.62 /mh	3,285	55.01	16,503	-	-	-	-	-	-	19,789	30,247
				40.01 Above Ground Process Piping	900 lf		216		9,856	55.01	49,510							59,366	90,742
				40 Process Piping	900 lf		216		9,856	55.01	49,510							59,366	90,742
			43	Process Equipment															
			43.00	Pumps															
				Transfer Pumps 3 hp, 100 gpm	4 ea	35.000 mh / ea	140	47.77 /mh	6,688	1,500.30	6,001	-	-	-	20,000.00	-	80,000	92,690	141,111
				Softened Water Pumps < 1 hp, 65 gpm	4 ea	12.000 mh / ea	48	47.77 /mh	2,293	200.00	800	-	-	-	5,000.00	-	20,000	23,093	35,198
				Metering Pump	8 ea	10.000 mh / ea	80	34.45 /mh	2,756	-	-	-	-	-	2,448.00	-	19,584	22,340	34,084
				Hose Pumps	8 ea	10.000 mh / ea	80	34.45 /mh	2,756	-	-	-	-	-	19,500.00	-	156,000	158,756	241,125
				43.00 Pumps	1 ls		348		14,493	6,801.20	6,801					275,584.00	275,584	296,878	451,518
			43.13	Chemical System Equipment															
				Water Softner 100 GPM	4 ea	54.000 mh / ea	216	24.89 /mh	5,375	-	-	-	-	-	1,800.00	-	7,200	12,575	19,435
				Fiberglass Tanks 10,000 gal, 12' Diameter x 11.41' h Hydrochlorite)	3 ea	1,420 cd / ea	170	1,757.90 /cd	7,489	-	-	-	-	1,056.45	3,169	13,500.00	40,500	51,158	78,364
				Fiberglass Tanks 10,000 gal, 14' Diameter x 11.41' h Brine Maker)	2 ea	1,420 cd / ea	114	1,757.90 /cd	4,992	-	-	-	-	1,056.45	2,113	15,750.00	31,500	38,605	59,072
				Day Tank 5.67' diameter, 1000 gallon	3 ea	1.000 mh / ea	3	41.79 /mh	125	-	-	-	-	-	3,500.00	-	10,500	10,625	16,134
				Wall Mt Residual analyzer	4 ea	2.000 mh / ea	8	30.57 /mh	245	-	-	-	-	-	7,000.00	-	28,000	28,245	42,883
				Chlorine evaporator	4 ea	2.000 mh / ea	8	30.57 /mh	245	-	-	-	-	-	4,000.00	-	16,000	16,245	24,670
				Solution Panels 1"	2 ea	2.000 mh / ea	4	30.57 /mh	122	-	-	-	-	-	8,000.00	-	16,000	16,122	24,477
				Chlorine System Testing	1 ea	2.000 mh / ea	2	30.57 /mh	61	-	-	-	-	-	-	-	-	61	97
				Chlorine Leak Detector	4 ea	1.000 mh / ea	4	30.57 /mh	122	-	-	-	-	-	4,000.00	-	16,000	16,122	24,477
				Chlorine Gas Educators	4 ea	1.000 mh / ea	4	30.57 /mh	122	-	-	-	-	-	5,000.00	-	20,000	20,122	30,548
				Hypochlorite Generators	2 ea	2,000.000 mh / ea	4,000	30.57 /mh	122,267	-	-	-	-	-	906,384.00	-	1,812,768	1,935,035	2,944,780
				43.13 Chemical System Equipment			4,533		141,166								1,998,468	2,144,916	3,264,938
				43 Process Equipment	1 ls		4,881		155,659	6,801.20	6,801			5,282.25	5,282	2,274,052.00	2,274,052	2,441,794	3,716,457
				4C Chlorine - Add New Onsite Generation of Hypochlorite Facility	1 ls		7,690		269,979	209,747.09	209,747	704,644.60	704,645	10,450.26	10,450	2,274,052.00	2,274,052	3,468,873	5,283,082
				04 Chlorine	1 ls		11,599		425,786	496,526.88	496,527	1,728,923.90	1,728,924	21,024.20	21,024	2,918,836.00	2,918,836	5,591,097	8,514,922

WBS Lvl 1	WBS Lvl 2	WBS Lvl 3	WBS Lvl 4	Description	Takeoff Quantity	Labor Productivity	Man Hours	Labor Price	Labor Amount	Material Cost/Unit	Material Amount	Subcontract Cost/Unit	Subcontract Amount	Const Equip Cost/Unit	Const Equip Amount	Process Equip Cost/Unit	Process Equip Amount	Total Amount	Grand Total Amount	
05				Clearwell																
	5A			New Large Clearwell 275' x 137' x 24'h ID Dimensions																
		49		Concrete Clearwell Construction																
			03.00	Foundation Mat																
				Keyway 6"	872 lf	0.050 mh / lf	44	39.49 /mh	1,722	0.67	586	-	-	-	-	-	-	2,308	3,615	
				Mat Foundation Edge Form 30"	2,180 sf	0.350 mh / sf	763	39.49 /mh	30,135	1.31	2,862	-	-	-	-	-	-	32,997	52,039	
				Waterstop 6" Flat	872 lf	0.110 mh / lf	96	39.18 /mh	3,759	2.10	1,832	-	-	-	-	-	-	5,590	8,729	
				Strip & Oil Mat Found. Form	2,180 sf	0.005 mh / sf	11	39.17 /mh	427	0.03	65	-	-	-	-	-	-	492	775	
				Rebar- Foundation Mat (100 #/cy)	200 tn	28.006 mh / tn	5,612	43.53 /mh	244,287	997.70	199,939	-	-	-	-	-	-	444,226	690,088	
				Rebar Support - bricks (.12/sf)	5,132 ea	0.002 mh / ea	10	43.53 /mh	447	0.26	1,347	-	-	-	-	-	-	1,794	2,752	
				Finish- Hard Trowel	42,763 sf	0.023 mh / sf	984	39.17 /mh	38,530	-	-	-	-	-	-	-	-	38,530	60,983	
				Pump Place Mat Foundation 30"	3,960 cy	0.500 mh / cy	1,980	41.39 /mh	81,950	-	-	-	-	4.59	18,169	-	-	100,119	158,620	
				Pump Place Thickened Mat @ Columns 6"x26"x2.5' deep, 36 ea	120 cy	0.500 mh / cy	60	41.39 /mh	2,484	-	-	-	-	3.67	440	-	-	2,924	4,632	
				4000 psi Concrete	4,080 cy	-	-	/cy	-	142.00	579,360	-	-	-	-	-	-	579,360	879,304	
				Liquid Curing Compounds	44,943 sf	0.003 mh / sf	135	39.17 /mh	5,282	0.06	2,643	-	-	-	-	-	-	7,925	12,371	
				6 Mil. Vapor Barrier	47,000 sf	0.002 mh / sf	94	43.53 /mh	4,092	0.05	2,468	-	-	-	-	-	-	6,560	10,223	
				03.00 Foundation Mat	4,080 cy		9,789		413,116	193.90	791,103			4.56	18,609			1,222,828	1,884,130	
			03.03	Columns																
				Form Square Columns 24" h	6,912 sf	0.165 mh / sf	1,140	39.49 /mh	45,035	1.60	11,034	-	-	-	-	-	-	56,069	88,024	
				Chamfer	3,456 lf	0.015 mh / lf	52	39.49 /mh	2,047	0.57	1,960	-	-	-	-	-	-	4,007	6,215	
				Strip & Oil Column Form	6,912 sf	0.005 mh / sf	35	39.17 /mh	1,354	0.03	207	-	-	-	-	-	-	1,561	2,458	
				Superplasticizers @ Columns	128 cy	-	-	/cy	-	8.40	1,075	-	-	-	-	-	-	1,075	1,632	
				Column Rebar (120 #/cy)	8 tn	20.004 mh / tn	154	43.53 /mh	6,687	997.70	7,662	-	-	-	-	-	-	14,349	22,213	
				Finish- Float	288 sf	0.017 mh / sf	5	39.17 /mh	192	-	-	-	-	-	-	-	-	192	304	
				Pump Place Columns 36 ea	128 cy	1.600 mh / cy	205	41.39 /mh	8,478	-	-	-	-	7.49	959	-	-	9,437	14,944	
				4000 psi Concrete	128 cy	-	-	/cy	-	142.00	18,176	-	-	-	-	-	-	18,176	27,586	
				Grind/Patch Columns	6,912 sf	0.013 mh / sf	90	39.17 /mh	3,520	0.03	207	-	-	-	-	-	-	3,728	5,886	
				Rub Columns	6,912 sf	0.065 mh / sf	449	39.17 /mh	17,597	0.06	415	-	-	-	-	-	-	18,012	28,480	
				Liquid Curing Compounds	6,912 sf	0.003 mh / sf	21	39.17 /mh	812	0.06	407	-	-	-	-	-	-	1,219	1,903	
				03.03 Columns	128 cy		2,150		85,723	321.43	41,143			7.49	959			127,825	199,645	
			03.04	Walls																
				Keyway 6"	832 lf	0.050 mh / lf	42	39.49 /mh	1,643	0.67	559	-	-	-	-	-	-	2,202	3,449	
				Vertical Wall Keyway 6"	500 lf	0.110 mh / lf	55	39.49 /mh	2,172	0.67	336	-	-	-	-	-	-	2,508	3,948	
				Panel Form System 24" h	39,936 sf	0.190 mh / sf	7,589	39.49 /mh	299,689	1.84	73,397	-	-	-	-	-	-	373,086	585,718	
				Waterstop 6" Flat	1,332 lf	0.110 mh / lf	147	39.18 /mh	5,741	2.10	2,798	-	-	-	-	-	-	8,539	13,333	
				Strip & Oil Wall Forms	39,936 sf	0.005 mh / sf	200	39.17 /mh	7,822	0.03	1,198	-	-	-	-	-	-	9,021	14,199	
				Superplasticizers @ Walls	1,479 cy	-	-	/cy	-	8.40	12,425	-	-	-	-	-	-	12,425	18,858	
				Rebar- Walls (125 #/cy)	92 tn	15.003 mh / tn	1,387	43.53 /mh	60,367	997.70	92,227	-	-	-	-	-	-	152,594	235,518	
				Finish- Top of Wall	3,328 sf	0.008 mh / sf	27	39.17 /mh	1,043	-	-	-	-	-	-	-	-	1,043	1,651	
				Pump Place Foundation Walls 24"	1,479 cy	1.150 mh / cy	1,701	41.39 /mh	70,410	-	-	-	-	6.65	9,835	-	-	80,245	127,092	
				4000 psi Concrete	1,479 cy	-	-	/cy	-	142.00	210,018	-	-	-	-	-	-	210,018	318,748	
				Grind/Patch Walls	39,936 sf	0.013 mh / sf	519	39.17 /mh	20,338	0.03	1,198	-	-	-	-	-	-	21,537	34,009	
				Rub Walls	40,808 sf	0.058 mh / sf	2,367	39.17 /mh	92,703	0.06	2,448	-	-	-	-	-	-	95,151	150,439	
				Liquid Curing Compounds	39,936 sf	0.002 mh / sf	80	39.17 /mh	3,129	0.06	2,349	-	-	-	-	-	-	5,478	8,517	
				03.04 Walls	1,479 cy		14,113		565,058	269.75	398,954			6.65	9,835			973,847	1,515,478	
			03.06	Suspended Flat Slab																
				Form Suspended Slab Bottom	39,336 sf	0.180 mh / sf	7,082	39.49 /mh	279,650	2.18	85,927	-	-	-	-	-	-	-	365,577	573,019
				Slab Edge Form 12"	840 sf	0.250 mh / sf	210	39.49 /mh	8,294	5.17	4,344	-	-	-	-	-	-	12,638	19,720	
				Strip & Oil Suspended Slab Forms	40,176 sf	0.005 mh / sf	201	39.17 /mh	7,869	0.04	1,648	-	-	-	-	-	-	9,517	14,956	
				Superplasticizers	1,462 cy	-	-	-	-	8.40	12,282	-	-	-	-	-	-	12,282	18,641	
				Rebar- Suspended Slab (225 #/cy)	164 tn	20.004 mh / tn	3,290	43.53 /mh	143,215	997.70	164,102	-	-	-	-	-	-	307,317	475,728	
				Finish- Hard Trowel	39,336 sf	0.030 mh / sf	1,180	39.17 /mh	46,229	-	-	-	-	-	-	-	-	46,229	73,168	
				Pump Place Suspended Slab 12"	1,462 cy	1.800 mh / cy	2,632	41.39 /mh	108,941	-	-	-	-	6.65	9,728	-	-	118,669	187,905	
				4000 psi Concrete	1,462 cy	-	-	-	-	142.00	207,604	-	-	-	-	-	-	207,604	315,084	
				Liquid Curing Compounds	79,512 sf	0.003 mh / sf	239	39.17 /mh	9,345	0.68	54,278	-	-	-	-	-	-	63,622	97,168	
				03.06 Suspended Flat Slab	1,462 cy		14,834		603,544	362.64	530,184			6.65	9,728			1,143,456	1,775,389	
			05.01	Misc Metals																
				Ladder Bolted to Concrete, w/o cage- aluminum, 4 ea x 20'	80 lf	0.750 mh / lf	60	/mh	-	68.25	5,460	-	-	-	-	-	-	5,460	8,287	
				Goose Neck Air Vents 24" Diameter	10 ea	3.200 mh / ea	32	36.09 /mh	1,155	2,500.00	25,000	-	-	-	-	-	-	26,155	39,770	
				Aluminum Access Hatch 4' x 6'	4 ea	5.000 mh / ea	20	36.09 /mh	722	1,750.00	7,000	-	-	-	-	-	-	7,722	11,766	
				05.01 Misc Metals	1 ls		112		1,876	37,460.00	37,460							39,336	59,824	
			31.01	Dewatering																
				Remove Dewatering System	1 ls	2.000 cd / ls	96	2,249.33 /cd	4,499	-	-	227.27	227	1,295.68	1,296	-	-	6,022	9,527	
				24" Wells, well casing, pea gravel	70 lf	-	-	/lf	-	-	-	150.00	10,500	-	-	-	-	10,500	15,936	
				Set & Wire Pumps	2 ea	2.000 ea / cd	48	2,249.33 /cd	2,249	25,000.00	50,000	-	-	323.92	648	-	-	52,897	80,477	
				Maintenance/Operation	2 ea	1.000 ea / cd	96	2,249.33 /cd	4,499	1,000.00	2,000	-	-	647.84	1,296	-	-	7,794	12,218	
				Suction Piping	80 lf	110.000 lf / cd	35	2,249.33 /cd	1,636	15.00	1,200	-	-	5.89	471	-	-	3,307	5,160	
				Header Piping	200 lf	200.000 lf / cd	48	2,249.33 /cd	2,249	35.00	7,000	-	-	3.24	648	-	-	9,897	15,215	
				Valving	1 ls	1.000 ls / cd	48	2,249.33 /cd	2,249	5,000.00	5,000	-	-	647.84	648	-	-	7,897	12,180	
				Run Temp Power to Pumps																

WBS Lvl 1	WBS Lvl 2	WBS Lvl 3	WBS Lvl 4	Description	Takeoff Quantity	Labor Productivity	Man Hours	Labor Price	Labor Amount	Material Cost/Unit	Material Amount	Subcontract Cost/Unit	Subcontract Amount	Const Equip Cost/Unit	Const Equip Amount	Process Equip Cost/Unit	Process Equip Amount	Total Amount	Grand Total Amount
				31.13 Soil Disposal	40,796 cy		3,672		143,840					8.23	335,769			479,609	762,040
			31.20	Structure Stone Base															
				Structure Subbase Stone-Loaders/Truck - 41895 sf x 4"	90 cy	0.003 cd / cy	11	1,609.56 /cd	439	28.28	2,545	-	-	10.02	901	-	-	3,886	5,992
				31.20 Structure Stone Base	90 cy		11		439	28.28	2,545			10.02	901			3,886	5,992
				49 Concrete Clearwell Construction	39,339 gsf		53,389		2,155,181	84.79	3,335,679	18.12	712,820	20.44	804,164			7,007,844	10,835,348
				5A New Large Clearwell 275' x 137' x 24'h ID Dimensions	1 ls		53,389		2,155,181	3,335,678.76	3,335,679	712,820.39	712,820	804,164.18	804,164			7,007,844	10,835,348
				New Small Clearwell & UV															
			5B	Concrete Clearwell Construction															
			49	Foundation Mat															
				03.00 Foundation Mat															
				Keyway 6"	262 lf	0.050 mh / lf	13	39.49 /mh	517	0.67	176	-	-	-	-	-	-	694	1,086
				Mat Foundation Edge Form 30"	655 sf	0.350 mh / sf	229	39.49 /mh	9,054	1.31	860	-	-	-	-	-	-	9,914	15,636
				Waterstop 6" Flat	262 lf	0.110 mh / lf	29	39.18 /mh	1,129	2.10	550	-	-	-	-	-	-	1,680	2,623
				Strip & Oil Mat Found. Form	655 sf	0.005 mh / sf	3	39.17 /mh	128	0.03	20	-	-	-	-	-	-	148	233
				Rebar- Foundation Mat (100 #/cy)	20 tn	28.006 mh / tn	560	43.53 /mh	24,380	997.70	19,954	-	-	-	-	-	-	44,334	68,871
				Rebar Support - bricks (.12/sf)	516 ea	0.002 mh / ea	1	43.53 /mh	45	0.26	135	-	-	-	-	-	-	180	277
				Finish- Hard Trowel	4,298 sf	0.023 mh / sf	99	39.17 /mh	3,873	-	-	-	-	-	-	-	-	3,873	6,129
				Pump Place Mat Foundation 30"	398 cy	0.500 mh / cy	199	41.39 /mh	8,236	-	-	-	-	4.59	1,826	-	-	10,062	15,942
				Pump Place Thickened Mat @ Columns 6"x26"x2.5' deep, 36 ea	3 cy	0.500 mh / cy	2	41.39 /mh	62	-	-	-	-	3.67	11	-	-	73	116
				4000 psi Concrete	401 cy					142.00	56,942	-	-	-	-	-	-	56,942	86,422
				Liquid Curing Compounds	4,953 sf	0.003 mh / sf	15	39.17 /mh	582	0.06	291	-	-	-	-	-	-	873	1,363
				6 Mil. Vapor Barrier	10,200 sf	0.002 mh / sf	20	43.53 /mh	888	0.05	536	-	-	-	-	-	-	1,424	2,219
				03.00 Foundation Mat	401 cy		1,170		48,896	198.17	79,464			4.58	1,837			130,197	200,916
				03.03 Columns															
				Form Square Columns 24' h	192 sf	0.165 mh / sf	32	39.49 /mh	1,251	1.60	306	-	-	-	-	-	-	1,557	2,445
				Chamfer	96 lf	0.015 mh / lf	1	39.49 /mh	57	0.57	54	-	-	-	-	-	-	111	173
				Strip & Oil Column Form	88 sf	0.005 mh / sf	0	39.17 /mh	17	0.03	3	-	-	-	-	-	-	20	31
				Superplasticizers @ Columns	4 cy					8.40	34	-	-	-	-	-	-	34	51
				Column Rebar (120 #/cy)	0 tn	20.004 mh / tn	5	43.53 /mh	209	997.70	239	-	-	-	-	-	-	448	694
				Finish- Float	4 sf	0.017 mh / sf	0	39.17 /mh	3	-	-	-	-	-	-	-	-	3	4
				Pump Place Columns 1 ea	4 cy	1.600 mh / cy	6	41.39 /mh	265	-	-	-	-	7.49	30	-	-	295	467
				4000 psi Concrete	4 cy					142.00	568	-	-	-	-	-	-	568	862
				Grind/Patch Columns	192 sf	0.013 mh / sf	2	39.17 /mh	98	0.03	6	-	-	-	-	-	-	104	164
				Rub Columns	192 sf	0.065 mh / sf	12	39.17 /mh	489	0.06	12	-	-	-	-	-	-	500	791
				Liquid Curing Compounds	192 sf	0.003 mh / sf	1	39.17 /mh	23	0.06	11	-	-	-	-	-	-	34	53
				03.03 Columns	4 cy		60		2,411	308.30	1,233			7.49	30			3,674	5,735
				03.04 Walls															
				Keyway 6"	232 lf	0.050 mh / lf	12	39.49 /mh	458	0.67	156	-	-	-	-	-	-	614	962
				Vertical Wall Keyway 6"	48 lf	0.110 mh / lf	5	39.49 /mh	209	0.67	32	-	-	-	-	-	-	241	379
				Panel Form System 24' h	11,144 sf	0.190 mh / sf	2,118	39.49 /mh	83,627	1.84	20,481	-	-	-	-	-	-	104,108	163,442
				Waterstop 6" Flat	280 lf	0.110 mh / lf	31	39.18 /mh	1,207	2.10	588	-	-	-	-	-	-	1,795	2,803
				Strip & Oil Wall Forms	11,144 sf	0.005 mh / sf	56	39.17 /mh	2,183	0.03	334	-	-	-	-	-	-	2,517	3,962
				Superplasticizers @ Walls	413 cy					8.40	3,470	-	-	-	-	-	-	3,470	5,266
				Rebar- Walls (125 #/cy)	26 tn	15.003 mh / tn	390	43.53 /mh	16,979	997.70	25,940	-	-	-	-	-	-	42,919	66,243
				Finish- Top of Wall	464 sf	0.008 mh / sf	4	39.17 /mh	145	-	-	-	-	-	-	-	-	145	230
				Pump Place Foundation Walls 24"	413 cy	1.150 mh / cy	475	41.39 /mh	19,662	-	-	-	-	6.65	2,746	-	-	22,408	35,489
				4000 psi Concrete	413 cy					142.00	58,646	-	-	-	-	-	-	58,646	89,008
				Grind/Patch Walls	11,144 sf	0.013 mh / sf	145	39.17 /mh	5,675	0.03	334	-	-	-	-	-	-	6,010	9,490
				Rub Walls	5,804 sf	0.058 mh / sf	337	39.17 /mh	13,185	0.06	348	-	-	-	-	-	-	13,533	21,396
				Liquid Curing Compounds	11,144 sf	0.002 mh / sf	22	39.17 /mh	873	0.06	655	-	-	-	-	-	-	1,529	2,377
				03.04 Walls	413 cy		3,594		144,203	268.73	110,986			6.65	2,746			257,935	401,047
				03.06 Suspended Flat Slab															
				Form Suspended Slab Bottom	3,605 sf	0.180 mh / sf	649	39.49 /mh	25,629	2.18	7,875	-	-	-	-	-	-	33,504	52,515
				Slab Edge Form 12"	240 sf	0.250 mh / sf	60	39.49 /mh	2,370	5.17	1,241	-	-	-	-	-	-	3,611	5,634
				Strip & Oil Suspended Slab Forms	3,845 sf	0.005 mh / sf	19	39.17 /mh	753	0.04	158	-	-	-	-	-	-	911	1,431
				Superplasticizers	134 cy					8.40	1,126	-	-	-	-	-	-	1,126	1,709
				Rebar- Suspended Slab (225 #/cy)	15 tn	20.004 mh / tn	300	43.53 /mh	13,061	997.70	14,966	-	-	-	-	-	-	28,026	43,385
				Finish- Hard Trowel	3,605 sf	0.030 mh / sf	108	39.17 /mh	4,237	-	-	-	-	-	-	-	-	4,237	6,706
				Pump Place Suspended Slab 12"	134 cy	1.800 mh / cy	241	41.39 /mh	9,985	-	-	-	-	6.65	892	-	-	10,877	17,223
				4000 psi Concrete	134 cy					142.00	19,028	-	-	-	-	-	-	19,028	28,879
				Liquid Curing Compounds	7,450 sf	0.003 mh / sf	22	39.17 /mh	876	0.68	5,086	-	-	-	-	-	-	5,961	9,104
				03.06 Suspended Flat Slab	134 cy		1,400		56,910	369.24	49,478			6.65	892			107,280	166,585
				05.01 Misc Metals															
				Ladder Bolted to Concrete, w/o cage- aluminum, 2 ea x 20"	40 VF	0.750 mh / VF	30	/mh		68.25	2,730	-	-	-	-	-	-	2,730	4,143
				Goose Neck Air Vents 24" Diameter	2 ea	3.200 mh / ea	6	36.09 /mh	231	2,500.00	5,000	-	-	-	-	-	-	5,231	7,954
				Aluminum Access Hatch 4' x 6'	2 ea	5.000 mh / ea	10	36.09 /mh	361	1,750.00	3,500	-	-	-	-	-	-	3,861	5,883
				05.01 Misc Metals	1 ls		46		592	11,230.00	11,230							11,822	17,981
				31.01 Dewatering															
				Remove Dewatering System	1 ls	2.000 cd / ls	96	2,249.33 /cd	4,499			227.27	227	1,295.68	1,296	-	-	6,022	9,527
				24" Wells, well casing, pea gravel	35 lf							150.00	5,250	-	-	-	-	5,250	7,968
				Set & Wire Pumps	1 ea	2.000 ea / cd	24	2,249.33 /cd	1,125	25,000.00	25,000	-	-	323.92	324</				

WBS Lvl 1	WBS Lvl 2	WBS Lvl 3	WBS Lvl 4	Description	Takeoff Quantity	Labor Productivity	Man Hours	Labor Price	Labor Amount	Material Cost/Unit	Material Amount	Subcontract Cost/Unit	Subcontract Amount	Const Equip Cost/Unit	Const Equip Amount	Process Equip Cost/Unit	Process Equip Amount	Total Amount	Grand Total Amount	
			31.12	Structure Backfill	1,648	cy	107		4,420					4.69	7,724			12,144	19,288	
			31.13	Soil Disposal																
				Spoils to Waste	3,671	cy	330	1,410.06 /day	12,943	-	-	-	-	8.23	30,214	-	-	43,157	68,572	
			31.13	Soil Disposal	3,671	cy	330		12,943					8.23	30,214			43,157	68,572	
			31.20	Structure Stone Base																
				Structure Subbase Stone-Loaders/Truck - 41895 sf x 4"	80	cy	10	1,609.56 /cd	390	28.28	2,262	-	-	10.02	801	-	-	3,454	5,327	
			31.20	Structure Stone Base	80	cy	10		390	28.28	2,262	-	-	10.02	801	-	-	3,454	5,327	
				49 Concrete Clearwell Construction	3,540	gsf	8,272		333,536	160.23	567,214	68.24	241,585	27.95	98,948	-	-	1,241,283	1,912,897	
50				UV Facility																
			03.00	Foundation Mat																
				Keyway 6"	340	lf	17	39.49 /mh	671	0.67	229	-	-	-	-	-	-	900	1,410	
				Mat Foundation Edge Form 30"	850	sf	298	39.49 /mh	11,750	1.31	1,116	-	-	-	-	-	-	12,866	20,290	
				Waterstop 6" Flat	340	lf	37	39.18 /mh	1,466	2.10	714	-	-	-	-	-	-	2,180	3,403	
				Strip & Oil Mat Found. Form	850	sf	4	39.17 /mh	166	0.03	26	-	-	-	-	-	-	192	302	
				Rebar- Foundation Mat (100 #/cy)	33	tn	928	43.53 /mh	40,410	997.70	33,074	-	-	-	-	-	-	73,484	114,154	
				Rebar Support - bricks (.12/sf)	859	ea	2	43.53 /mh	75	0.26	226	-	-	-	-	-	-	300	461	
				Finish- Hard Trowel	7,156	sf	165	39.17 /mh	6,448	-	-	-	-	-	-	-	-	6,448	10,205	
				Pump Place Mat Foundation 30"	663	cy	332	41.39 /mh	13,720	-	-	-	-	-	4.59	3,042	-	16,762	26,557	
				4000 psi Concrete	663	cy		/cy		142.00	94,146	-	-	-	-	-	-	94,146	142,887	
				Liquid Curing Compounds	8,006	sf	24	39.17 /mh	941	0.06	471	-	-	-	-	-	-	1,412	2,204	
				6 Mil. Vapor Barrier	16,700	sf	33	43.53 /mh	1,454	0.05	877	-	-	-	-	-	-	2,331	3,632	
			03.00	Foundation Mat	663	cy	1,840		77,101	197.40	130,877			4.59	3,042			211,020	325,505	
			03.03	Columns																
				Form Rectangle Columns 9.33'	672	sf	111	39.49 /mh	4,378	1.60	1,073	-	-	-	-	-	-	5,451	8,558	
				Form Rectangle Columns 26'	2,288	sf	378	39.49 /mh	14,908	1.60	3,652	-	-	-	-	-	-	18,560	29,138	
				Chamfer	1,480	lf	22	39.49 /mh	877	0.57	839	-	-	-	-	-	-	1,716	2,662	
				Strip & Oil Column Form	2,960	sf	15	39.17 /mh	580	0.03	89	-	-	-	-	-	-	669	1,052	
				Superplasticizers @ Columns	54	cy		/cy		8.40	454	-	-	-	-	-	-	454	689	
				Column Rebar (120 #/cy)	3	tn	65	43.53 /mh	2,821	997.70	3,233	-	-	-	-	-	-	6,054	9,371	
				Finish- Float	80	sf	1	39.17 /mh	53	-	-	-	-	-	-	-	-	53	84	
				Pump Place Columns 20 ea	54	cy	86	41.39 /mh	3,577	-	-	-	-	-	7.49	404	-	3,981	6,305	
				4000 psi Concrete	54	cy		/cy		142.00	7,668	-	-	-	-	-	-	7,668	11,638	
				Grind/Patch Columns	2,960	sf	38	39.17 /mh	1,507	0.03	89	-	-	-	-	-	-	1,596	2,521	
				Rub Columns	2,960	sf	192	39.17 /mh	7,536	0.06	178	-	-	-	-	-	-	7,713	12,196	
				Liquid Curing Compounds	2,960	sf	9	39.17 /mh	348	0.06	174	-	-	-	-	-	-	522	815	
			03.03	Columns	54	cy	918		36,585	323.11	17,448			7.49	404			54,437	85,028	
			03.04	Walls																
				Brick Ledge Forms	161	sf	48	39.49 /mh	1,908	2.21	355	-	-	-	-	-	-	2,263	3,558	
				Keyway 6"	188	lf	9	39.49 /mh	371	0.67	126	-	-	-	-	-	-	498	779	
				Vertical Wall Keyway 6"	80	lf	9	39.49 /mh	348	0.67	54	-	-	-	-	-	-	401	632	
				Panel Form System 17" h	6,392	sf	1,215	39.49 /mh	47,967	1.84	11,748	-	-	-	-	-	-	59,715	93,748	
				Waterstop 6" Flat	268	lf	29	39.18 /mh	1,155	2.10	563	-	-	-	-	-	-	1,718	2,683	
				Strip & Oil Wall Forms	6,392	sf	32	39.17 /mh	1,252	0.03	192	-	-	-	-	-	-	1,444	2,273	
				Superplasticizers @ Walls	237	cy		/cy		8.40	1,991	-	-	-	-	-	-	1,991	3,022	
				Rebar- Walls (125 #/cy)	18	tn	270	43.53 /mh	11,755	997.70	17,959	-	-	-	-	-	-	29,713	45,860	
				Finish- Top of Wall	376	sf	3	39.17 /mh	118	-	-	-	-	-	-	-	-	118	187	
				Pump Place Foundation Walls 24"	237	cy	273	41.39 /mh	11,283	-	-	-	-	-	6.65	1,576	-	12,859	20,366	
				Pump Place Brick Ledge	1	cy	2	41.39 /mh	83	-	-	-	-	-	14.42	14	-	97	154	
				4000 psi Concrete	238	cy		/cy		142.00	33,796	-	-	-	-	-	-	33,796	51,293	
				Grind/Patch Walls	6,392	sf	83	39.17 /mh	3,255	0.03	192	-	-	-	-	-	-	3,447	5,443	
				Rub Walls	3,196	sf	185	39.17 /mh	7,260	0.06	192	-	-	-	-	-	-	7,452	11,782	
				Liquid Curing Compounds	6,392	sf	13	39.17 /mh	501	0.06	376	-	-	-	-	-	-	877	1,363	
			03.04	Walls	238	cy	2,172		87,255	283.79	67,543			6.68	1,590			156,388	243,142	
			03.07	Suspended Beams																
				Beam Side Forms	3,181	sf	668	39.49 /mh	26,384	2.21	7,016	-	-	-	-	-	-	33,399	52,405	
				Beam Bottom Forms	1,060	sf	223	39.49 /mh	8,792	2.21	2,338	-	-	-	-	-	-	11,130	17,463	
				Chamfer	2,120	lf	32	39.49 /mh	1,256	0.57	1,202	-	-	-	-	-	-	2,458	3,813	
				Strip & Oil Beam Forms	4,241	sf	21	39.17 /mh	831	0.03	127	-	-	-	-	-	-	958	1,508	
				Superplasticizers @ Beams	118	cy		/cy		8.40	991	-	-	-	-	-	-	991	1,505	
				Rebar- Beams (250 #/cy)	15	tn	221	43.53 /mh	9,632	997.70	14,716	-	-	-	-	-	-	24,348	37,580	
				Finish- Top of Beam	1,060	sf	8	39.17 /mh	332	-	-	-	-	-	-	-	-	332	526	
				Pump Place Beams @ Roof	118	cy	236	41.39 /mh	9,773	-	-	-	-	-	14.42	1,702	-	11,474	18,176	
				4000 psi Concrete	118	cy		/cy		142.00	16,756	-	-	-	-	-	-	16,756	25,431	
				Grind/Patch Beams	4,241	sf	55	39.17 /mh	2,160	0.03	127	-	-	-	-	-	-	2,287	3,612	
				Rub Beams	4,241	sf	360	39.17 /mh	14,119	0.06	254	-	-	-	-	-	-	14,374	22,733	
				Liquid Curing Compounds	5,301	sf	11	39.17 /mh	415	0.06	312	-	-	-	-	-	-	727	1,131	
			03.07	Suspended Beams	118	cy	1,836		73,694	371.52	43,840			14.42	1,702			119,235	185,880	
			03.08	Pads & Curbs																
				Roof Parapet Curb Forms 48" h	3,876	sf	775	39.49 /mh	30,617	1.52	5,902	-	-	-	-	-	-	36,520	57,417	
				Chamfer	968	lf	15	39.49 /mh	573	0.57	549	-	-	-	-	-	-	1,122	1,741	
				Strip & Oil Equipment Curb Forms	3,876	sf	19	39.17 /mh	759	0.03	116	-	-	-	-	-	-	876	1,378	
				Rebar- Pads (100 #/cy)	4	tn	65	43.53 /mh	2,821	997.70	3,592	-	-	-	-	-	-	6,413	9,916	
				Finish- Float	484	sf	8	39.17 /mh	322	-	-	-	-	-	-	-	-	322	510	
				Pump Place Curbs 12"	72	cy	180	41.39 /mh	7,452	-	-	-	-	-	9.86	710	-	8,161	12,923	
				4000 psi Concrete	72	cy		/cy		142										

WBS Lvl 1	WBS Lvl 2	WBS Lvl 3	WBS Lvl 4	Description	Takeoff Quantity	Labor Productivity	Man Hours	Labor Price	Labor Amount	Material Cost/Unit	Material Amount	Subcontract Cost/Unit	Subcontract Amount	Const Equip Cost/Unit	Const Equip Amount	Process Equip Cost/Unit	Process Equip Amount	Total Amount	Grand Total Amount
			05.01	Misc Metals															
				Alum Grating Work Platform @ UV Reactor 12' x 6.5' x 5' h, 2 ea	156 sf	0.035 mh / sf	5	42.08 /mh	230	12.39	1,933	-	-	-	-	-	-	2,163	3,298
				Alum Grating Banding	74 lf	/lf				23.70	1,754	-	-	-	-	-	-	1,754	2,662
				Aluminum Hatch & Frame Over Pipe Gallery 6.33' x 6.33'	0 ea	8.000 mh / ea	0	39.18 /mh	3	5,001.00	50	-	-	-	-	-	-	53	81
				05.01 Misc Metals	1 ls		129		5,478	27,924.05	27,924			837.50	838			34,240	52,384
			06.00	Wood															
				Misc Nailers & Blocking	7,071 sf	0.010 mh / sf	71	39.67 /mh	2,806	0.40	2,838	-	-	-	-	-	-	5,644	8,748
				PT Roof Blocking @ Top Of Masonry Wall	332 lf	0.035 mh / lf	12	39.67 /mh	461	1.82	604	-	-	-	-	-	-	1,065	1,647
				PT Roof Blocking @ Skylight Curb	156 lf	0.035 mh / lf	5	39.67 /mh	217	1.82	284	-	-	-	-	-	-	500	774
				06.00 Wood	1 ls		88		3,483	3,725.66	3,726							7,209	11,168
			07.00	Moisture Protection															
				Caulking @ Masonry Wall Joints- Exterior (.09 lf/sf)	1,223 lf	/lf						4.00	4,893	-	-	-	-	4,893	7,426
				Caulking @ Masonry Wall Joints- Interior	1,021 lf	/lf						4.00	4,085	-	-	-	-	4,085	6,200
				07.00 Moisture Protection	1 ls							8,977.80	8,978					8,978	13,626
			07.01	Roofing															
				Membrane Roofing- 60 mil EPDM Mechanically Attached w/ 3" Insulation	5,800 sf	/sf						3.00	17,403	-	-	-	-	17,403	26,414
				Aluminum Downspouts, 2 ea x 32" each	64 vf	/vf						18.00	1,152	-	-	-	-	1,152	1,749
				Scuppers	2 ea	/ea						50.01	100	-	-	-	-	100	152
				Aluminum Coping @ Roof Parapet 12" wide	332 lf	/lf						15.00	4,981	-	-	-	-	4,981	7,560
				Translucent Panel Skylight Frame & Panels	1,398 sf	/sf						38.01	53,135	-	-	-	-	53,135	80,643
				07.01 Roofing	1 sf							76,771.31	76,771					76,771	116,517
			08.00	Doors, Frames & Hardware															
				HM Single Frames- 16 ga 3x7'	5 ea	1.000 mh / ea	5	39.18 /mh	196	180.04	900	-	-	-	-	-	-	1,096	1,676
				HM Double Frames- 16 ga. 6x7'	1 ea	1.500 mh / ea	2	39.18 /mh	59	210.00	210	-	-	-	-	-	-	269	412
				HM Door Leafs- 3'x7' 20 ga. half glass	7 ea	1.500 ea / mh	5	39.18 /mh	183	450.09	3,151	-	-	-	-	-	-	3,333	5,071
				Overhead Doors- 10'x10' 24 ga steel manual 1" insulation 26 ga back-up panel	1 ea							2,255.00	2,255	-	-	-	-	2,255	3,422
				Finish Hardware by Leaf- Allowance	7 ea	8.002 mh / ea	56	39.18 /mh	2,194	900.18	6,301	-	-	-	-	-	-	8,496	13,036
				08.00 Doors, Frames & Hardware	1 ea		67		2,632	10,562.07	10,562	2,255.00	2,255					15,449	23,618
			09.00	Finishes															
				Paint HM Door Frames - primer (2) coats	7 ea	/ea						100.02	700	-	-	-	-	700	1,063
				Paint HM Doors - primer (2) coats	7 ea	/ea						140.03	980	-	-	-	-	980	1,488
				Paint CMU Block - block filler & (2) coat	10,186 sf							1.35	13,751	-	-	-	-	13,751	20,870
				09.00 Finishes	1 ls							15,431.44	15,431					15,431	23,421
			10.00	Specialty Items															
				Signs - Building ID	1 ea	/ea						3,000.60	3,001	-	-	-	-	3,001	4,554
				Signs - Doors	4 ea	/ea						30.01	120	-	-	-	-	120	182
				Fire Extinguisher CO2 10 lbs	4 ea	/ea						225.05	900	-	-	-	-	900	1,366
				10.00 Specialty Items	1 ls							4,020.81	4,021					4,021	6,102
			22.00	Plumbing															
				Plumbing Subcontract	7,071 sf	/sf						6.00	42,434	-	-	-	-	42,434	64,403
				22.00 Plumbing	1 ls							42,434.47	42,434					42,434	64,403
			23.00	HVAC															
				Ventilation & Unit Heater System	7,071 sf	/sf						45.00	318,195	-	-	-	-	318,195	482,930
				23.00 HVAC	1 sf							318,195.00	318,195					318,195	482,930
			26.00	UG Electrical															
				Building Electrical System	7,071 sf	/sf						16.00	113,159	-	-	-	-	113,159	171,743
				26.00 UG Electrical	1 ls							113,158.59	113,159					113,159	171,743
			26.01	Above Ground Electrical															
				Building Electrical System	7,071 sf	/sf						8.00	56,579	-	-	-	-	56,579	85,871
				Process Electrical System	7,071 sf	/sf						30.01	212,172	-	-	-	-	212,172	322,017
				26.01 Above Ground Electrical	1 ls							268,751.64	268,752					268,752	407,889
			26.02	Instrumentation & Controls															
				Controls & Instrumentation	1 ls	/ls						366,278.00	366,278	-	-	-	-	366,278	555,906
				26.02 Instrumentation & Controls	1 ls							366,278.00	366,278					366,278	555,906
			31.01	Dewatering															
				Remove Dewatering System	1 ls	2.000 cd / ls	96	2,249.33 /cd	4,499			227.27	227	1,295.68	1,296	-	-	6,022	9,527
				24" Wells, well casing, pea gravel	35 lf	/lf						150.00	5,250	-	-	-	-	5,250	7,968
				Set & Wire Pumps	1 ea	2.000 ea / cd	24	2,249.33 /cd	1,125	25,000.00	25,000	-	-	323.92	324	-	-	26,449	40,238
				Maintenance/Operation	1 ea	1.000 ea / cd	48	2,249.33 /cd	2,249	1,000.00	1,000	-	-	647.84	648	-	-	3,897	6,109
				Suction Piping	80 lf	110.000 lf / cd	35	2,249.33 /cd	1,636	15.00	1,200	-	-	5.89	471	-	-	3,307	5,160
				Header Piping	200 lf	200.000 lf / cd	48	2,249.33 /cd	2,249	35.00	7,000	-	-	3.24	648	-	-	9,897	15,215
				Valving	1 ls	1.000 ls / cd	48	2,249.33 /cd	2,249	5,000.00	5,000	-	-	647.84	648	-	-	7,897	12,180
				Run Temp Power to Pumps	1 ea	1.000 ea / cd	32	1,439.45 /cd	1,439	2,000.00	2,000	-	-	226.08	226	-	-	3,666	5,674
				Electric Consumption	4 mo	1.000 mo / ls				1,000.00	4,000	-	-	-	-	-	-	4,000	6,071
				31.01 Dewatering	1 ls		331		15,447	45,200.00	45,200	5,477.27	5,477	4,260.36	4,260			70,384	108,142
			31.02	Piles															
				Augered Piles CIP 18" x @ 25 ft depth, 10' oc = 104 ea (1 per 68 sf)	2,600 vf	0.002 cd / vf	291	2,146.97 /cd	11,166	35.16	91,407	-	-	2.58	6,709	-	-	109,282	167,079
				31.02 Piles	104 ea		291		11,166	878.91	91,407			64.51	6,709			109,282	167,079
			31.03	Excavation Shoring															
				Shoring System Design Engineer	1 ls							15,002.99	15,003	-	-	-	-	15,003	22,770
				Structure Sheeting (87' x 22' deep)	1,914 sf	0.001 cd / sf	94	2,465.38 /cd	3,633	16.00	30,630	-	-	0.75	1,440	-	-	35,704	54,531
				Tie Backs (1 per 80 sf of Sheeting, 87' x 18'= 1566 sf)	20 ea							2,377.48	47,549	-	-	-	-	47,549	72,167
				31.															

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			40.00	Under Ground Process Piping																
				Stone Pipe Bedding	5 cy	200.000 cy / cd	2	2,896.43 /cd	72	23.29	116	-	-	-	-	-	-	189	291	
				DI Pipe Push - Class 52 36	28 lf	0.500 mh / lf	14	51.34 /mh	719	225.44	6,312	-	-	-	-	-	-	7,031	10,718	
				Hydrostatic Testing	28 lf	0.021 ch / lf	2	182.49 /ch	107	0.16	4	-	-	-	-	-	-	112	177	
				DI Tee 36"	4 ea	20.524 mh / ea	82	45.62 /mh	3,745	19,000.00	76,000	-	-	-	-	-	-	79,745	121,274	
				DI Blind Flange 36"	1 ea	19.230 mh / ea	19	45.62 /mh	877	3,840.90	3,841	-	-	-	-	-	-	4,718	7,218	
				40.00 Under Ground Process Piping	28 lf		122		5,640	3,081.22	86,274			1.88	53			91,967	139,950	
			40.01	Above Ground Process Piping																
				Paint & Stencil Exposed Piping >20"	204 lf	-		-	-	-	-	25.01	5,101	-	-	-	-	5,101	7,742	
				Paint & Stencil Exposed Piping <20"	800 lf	-		-	-	-	-	10.00	8,002	-	-	-	-	8,002	12,144	
				Pipe Supports	17 ea	4.001 mh / ea	68	45.62 /mh	3,103	250.05	4,251	-	-	-	-	-	-	7,354	11,363	
				DI RJ Std Wgt Cap 36"	1 ea	5.068 mh / ea	5	45.62 /mh	231	4,020.80	4,021	-	-	-	-	-	-	4,252	6,468	
				Hydrostatic Testing	204 lf	0.021 ch / lf	17	182.49 /ch	782	0.16	33	-	-	-	-	-	-	815	1,287	
				Dresser Couplings 36"	4 ea	20.804 mh / ea	83	45.62 /mh	3,797	1,270.26	5,081	-	-	-	-	-	-	8,878	13,720	
				36" DI Wall Thimble 24" long	1 ea	5.001 ch / ea	20	182.49 /ch	913	1,286.25	1,286	-	-	1,200.15	1,200	-	-	3,399	5,307	
				Gasket/Nuts/Bolt Kit 30"	4 ea	2.501 mh / ea	10	45.62 /mh	456	175.04	700	-	-	-	-	-	-	1,156	1,785	
				Gasket/Nuts/Bolt Kit 36"	14 ea	3.001 mh / ea	42	45.62 /mh	1,917	225.05	3,151	-	-	-	-	-	-	5,067	7,815	
				Gasket/Nuts/Bolt Kit 48"	18 ea	1.000 mh / ea	18	45.62 /mh	821	425.09	7,652	-	-	-	-	-	-	8,473	12,913	
				DI Flanged Joint Pipe 30"	6 lf	3.051 mh / lf	18	45.62 /mh	835	310.21	1,861	-	-	-	-	-	-	2,696	4,147	
				DI Flanged Joint Pipe 36"	70 lf	3.471 mh / lf	243	45.62 /mh	11,084	426.62	29,864	-	-	-	-	-	-	40,947	62,867	
				DI Flanged Joint Pipe 48"	128 lf	4.371 mh / lf	559	45.62 /mh	25,524	711.68	91,096	-	-	-	-	-	-	116,620	178,655	
				DI Flanged 90 ell 30"	5 ea	17.874 mh / ea	89	45.62 /mh	4,077	2,317.06	11,585	-	-	-	-	-	-	15,662	24,036	
				DI Flanged 90 ell 48"	4 ea	25.715 mh / ea	103	45.62 /mh	4,693	6,635.22	26,541	-	-	-	-	-	-	31,234	47,709	
				DI Flanged Tee 36"	4 ea	20.524 mh / ea	82	45.62 /mh	3,745	19,000.00	76,000	-	-	-	-	-	-	79,745	121,274	
				DI Flanged Tee 48"	4 ea	25.715 mh / ea	103	45.62 /mh	4,693	24,821.92	99,288	-	-	-	-	-	-	103,980	158,118	
				DI Flanged Con Red 48x32"	4 ea	25.715 mh / ea	103	45.62 /mh	4,693	9,913.98	39,656	-	-	-	-	-	-	44,349	67,614	
				DI Flanged Con Red 48x36"	2 ea	25.715 mh / ea	51	45.62 /mh	2,346	11,157.43	22,315	-	-	-	-	-	-	24,661	37,581	
				DI Blind Flange 48"	1 ea	23.595 mh / ea	24	45.62 /mh	1,076	7,187.63	7,188	-	-	-	-	-	-	8,264	12,612	
				Chemical Piping & Accessories- ALLOWANCE	800 LF	0.240 mh / LF	192	45.62 /mh	8,761	55.01	44,009	-	-	-	-	-	-	52,770	80,659	
				40.01 Above Ground Process Piping	1 lf		1,831		83,547	475,575.26	475,575	13,102.62	13,103	1,200.15	1,200			573,425	875,815	
			40.02	Valves, Meters, Etc.																
				Magnetic Flow Meter, Inline - 48" w/ transmitter	2 ea	52.000 mh / ea	104	48.85 /mh	5,080	28,000.00	56,000	-	-	-	-	-	-	61,080	93,033	
				30" Butterfly Valve, 125 lb class, CI Body, Fig. w/ EIM elec actuator NEMA 4	4 ea	24.005 mh / ea	96	45.62 /mh	4,381	16,487.29	65,949	-	-	-	-	-	-	70,330	107,025	
				48" Butterfly Valve, 75 lb class, CI Body, Fig. w/ EIM elec actuator NEMA 4	4 ea	38.408 mh / ea	154	45.62 /mh	7,009	26,380.26	105,521	-	-	-	-	-	-	112,530	171,244	
				40.02 Valves, Meters, Etc.	1 ls		354		16,470	227,470.23	227,470							243,940	371,302	
			40.04	Hydropneumatic Piping System																
				Hydropneumatic Piping, Fitting & Valve Allowance	1 ls	mh / ls		45.62 /mh				17,000.00	17,000	-	-	-	-	17,000	25,801	
				40.04 Hydropneumatic Piping System	1 ls							17,000.00	17,000					17,000	25,801	
			41.22	Hoists & Cranes																
				Steel Bracket @ Column To Support Crane Rail Beam	10 ea	0.200 mh / ea	2	42.40 /mh	85	726.47	7,265	-	-	-	-	-	-	7,349	11,160	
				W 18 x 116 Crane Rail Beam	162 lf	-		-	-	86.88	14,075	-	-	-	-	-	-	14,075	21,362	
				Erect Steel W 18 x 116 Beams (20' long)	8 ea	5.000 ch / ea	200	197.59 /ch	7,904	-	-	-	-	518.13	4,145	-	-	12,049	19,106	
				Bridge Crane 3 ton 21 ft span, 81 ft runway beam. Equipment and installation. @ Maint Bldg	1 ea	-		-	-	-	-	-	-	-	-	110,000.00	110,000	110,000	166,949	
				41.22 Hoists & Cranes	1 ea		202		7,988	21,339.87	21,340			4,145.00	4,145	110,000.00	110,000	143,473	218,577	
			43.07	UV Disinfection Equipment																
				Centrifugal Blowers, 51-100 hp (Air Scour Blowers 1-4)	4 ea	40.008 mh / ea	160	47.77 /mh	7,645	1,500.30	6,001	-	-	150,029.95	600,120	-	-	613,766	976,309	
				UV Reactor #1, 2, 3 & 4	4 ea	60.012 mh / ea	240	45.62 /mh	10,951	5,001.00	20,004	-	-	-	-	250,950.00	1,003,800	1,034,755	1,571,176	
				43.07 UV Disinfection Equipment	1 ls		400		18,597	26,005.19	26,005			600,119.78	600,120	1,003,800.00	1,003,800	1,648,522	2,547,485	
				50 UV Facility	7,071 gsf		12,603		525,218	188.03	1,329,558	185.89	1,314,406	98.97	699,838	157.52	1,113,800	4,982,821	7,648,293	
				5B New Small Clearwell & UV	1 ls		20,875		858,754	1,896,771.69	1,896,772	1,555,991.82	1,555,992	798,786.78	798,787	1,113,800.00	1,113,800	6,224,105	9,561,190	
5C			49	Concrete Clearwell Construction																
			03.00	Foundation Mat																
				Keyway 6"	262 lf	0.050 mh / lf	13	39.49 /mh	517	0.67	176	-	-	-	-	-	-	694	1,086	
				Mat Foundation Edge Form 30"	655 sf	0.350 mh / sf	229	39.49 /mh	9,054	1.31	860	-	-	-	-	-	-	9,914	15,636	
				Waterstop 6" Flat	262 lf	0.110 mh / lf	29	39.18 /mh	1,129	2.10	550	-	-	-	-	-	-	1,680	2,623	
				Strip & Oil Mat Found. Form	655 sf	0.005 mh / sf	3	39.17 /mh	128	0.03	20	-	-	-	-	-	-	148	233	
				Rebar- Foundation Mat (100 #/cy)	20 tn	28.006 mh / tn	560	43.53 /mh	24,380	997.70	19,954	-	-	-	-	-	-	44,334	68,871	
				Rebar Support - bricks (.12/sf)	516 ea	0.002 mh / ea	1	43.53 /mh	45	0.26	135	-	-	-	-	-	-	180	277	
				Finish- Hard Trowel	4,298 sf	0.023 mh / sf	99	39.17 /mh	3,873	-	-	-	-	-	-	-	-	3,873	6,129	
				Pump Place Mat Foundation 30"	398 cy	0.500 mh / cy	199	41.39 /mh	8,236	-	-	-	-	4.59	1,826	-	-	10,062	15,942	
				Pump Place Thickened Mat @ Columns 6"x26"x2.5' deep, 36 ea	3 cy	0.500 mh / cy	2	41.39 /mh	62	-	-	-	-	3.67	11	-	-	73	116	
				4000 psi Concrete	401 cy	-		-	-	142.00	56,942	-	-	-	-	-	-	56,942	86,422	
				Liquid Curing Compounds	4,953 sf	0.003 mh / sf	15	39.17 /mh	582	0.06	291	-	-	-	-	-	-	873	1,363	
				6 Mil. Vapor Barrier	10,200 sf	0.002 mh / sf	20	43.53 /mh	888	0.05	536	-	-	-	-	-	-	1,424	2,219	
				03.00 Foundation Mat	401 cy		1,170		48,896	198.17	79,464			4.58	1,837			130,197	200,916	

WBS Lvl 1	WBS Lvl 2	WBS Lvl 3	WBS Lvl 4	Description	Takeoff Quantity	Labor Productivity	Man Hours	Labor Price	Labor Amount	Material Cost/Unit	Material Amount	Subcontract Cost/Unit	Subcontract Amount	Const Equip Cost/Unit	Const Equip Amount	Process Equip Cost/Unit	Process Equip Amount	Total Amount	Grand Total Amount
			03.04	Walls															
				Rub Walls	5,804 sf	0.058 mh / sf	337	39.17 /mh	13,185	0.06	348	-	-	-	-	-	-	13,533	21,396
				Liquid Curing Compounds	11,144 sf	0.002 mh / sf	22	39.17 /mh	873	0.06	655	-	-	-	-	-	-	1,529	2,377
				03.04 Walls	413 cy		3,594		144,203	268.73	110,986			6.65	2,746			257,935	401,047
			03.06	Suspended Flat Slab															
				Form Suspended Slab Bottom	3,605 sf	0.180 mh / sf	649	39.49 /mh	25,629	2.18	7,875	-	-	-	-	-	-	33,504	52,515
				Slab Edge Form 12"	240 sf	0.250 mh / sf	60	39.49 /mh	2,370	5.17	1,241	-	-	-	-	-	-	3,611	5,634
				Strip & Oil Suspended Slab Forms	3,845 sf	0.005 mh / sf	19	39.17 /mh	753	0.04	158	-	-	-	-	-	-	911	1,431
				Superplasticizers	134 cy					8.40	1,126	-	-	-	-	-	-	1,126	1,709
				Rebar- Suspended Slab (225 #/cy)	15 tn	20.004 mh / tn	300	43.53 /mh	13,061	997.70	14,966	-	-	-	-	-	-	28,026	43,385
				Finish- Hard Trowel	3,605 sf	0.030 mh / sf	108	39.17 /mh	4,237	-	-	-	-	-	-	-	-	4,237	6,706
				Pump Place Suspended Slab 12"	134 cy	1.800 mh / cy	241	41.39 /mh	9,985	-	-	-	-	6.65	892	-	-	10,877	17,223
				4000 psi Concrete	134 cy					142.00	19,028	-	-	-	-	-	-	19,028	28,879
				Liquid Curing Compounds	7,450 sf	0.003 mh / sf	22	39.17 /mh	876	0.68	5,086	-	-	-	-	-	-	5,961	9,104
				03.06 Suspended Flat Slab	134 cy		1,400		56,910	369.24	49,478			6.65	892			107,280	166,585
			05.01	Misc Metals															
				Ladder Bolted to Concrete, w/o cage- aluminum, 2 ea x 20'	40 VF	0.750 mh / VF	30	/mh		68.25	2,730	-	-	-	-	-	-	2,730	4,143
				Goose Neck Air Vents 24" Diameter	2 ea	3.200 mh / ea	6	36.09 /mh	231	2,500.00	5,000	-	-	-	-	-	-	5,231	7,954
				Aluminum Access Hatch 4' x 6'	2 ea	5.000 mh / ea	10	36.09 /mh	361	1,750.00	3,500	-	-	-	-	-	-	3,861	5,883
				05.01 Misc Metals	1 ls		46		592	11,230.00	11,230							11,822	17,981
			31.01	Dewatering															
				Remove Dewatering System	1 ls	2.000 cd / ls	96	2,249.33 /cd	4,499			227.27	227	1,295.68	1,296	-	-	6,022	9,527
				24" Wells, well casing, pea gravel	35 lf			/lf				150.00	5,250	-	-	-	-	5,250	7,968
				Set & Wire Pumps	1 ea	2.000 ea / cd	24	2,249.33 /cd	1,125	25,000.00	25,000	-	-	323.92	324	-	-	26,449	40,238
				Maintenance/Operation	1 ea	1.000 ea / cd	48	2,249.33 /cd	2,249	1,000.00	1,000	-	-	647.84	648	-	-	3,897	6,109
				Suction Piping	80 lf	110.000 lf / cd	35	2,249.33 /cd	1,636	15.00	1,200	-	-	5.89	471	-	-	3,307	5,160
				Header Piping	200 lf	200.000 lf / cd	48	2,249.33 /cd	2,249	35.00	7,000	-	-	3.24	648	-	-	9,897	15,215
				Valving	1 ls	1.000 ls / cd	48	2,249.33 /cd	2,249	5,000.00	5,000	-	-	647.84	648	-	-	7,897	12,180
				Run Temp Power to Pumps	1 ea	1.000 ea / cd	32	1,439.45 /cd	1,439	2,000.00	2,000	-	-	226.08	226	-	-	3,666	5,673
				Electric Consumption	2 mo	1.000 mo / ls		/ls		1,000.00	2,000	-	-	-	2,000	-	-	2,000	3,035
				31.01 Dewatering	1 ls		331		15,447	43,200.00	43,200	5,477.27	5,477	4,260.36	4,260			68,384	105,106
			31.02	Piles															
				Augered Piles CIP 18" x @ 25 ft depth, 119 ea (1 per 36.46 sf)	2,975 vf	0.002 cd / vf	333	2,146.97 /cd	12,776	35.16	104,591	-	-	2.58	7,676	-	-	125,043	191,177
				31.02 Piles	119 ea		333		12,776	878.91	104,591			64.51	7,676			125,043	191,177
			31.03	Excavation Shoring															
				Shoring System Design Engineer	1 ls							15,002.99	15,003	-	-	-	-	15,003	22,770
				Structure Sheeting (286' x 36' deep)	10,296 sf	0.001 cd / sf	507	2,465.38 /cd	19,545	16.00	164,769	-	-	0.75	7,748	-	-	192,062	293,337
				Tie Backs (1 per 80 sf of Sheeting, 286' x 26'= 7436 sf)	93 ea							2,377.48	221,105	-	-	-	-	221,105	335,575
				31.03 Excavation Shoring	10,296 sf		507		19,545	16.00	164,769	22.93	236,108	0.75	7,748			428,170	651,682
			31.10	Structure Excavation															
				Backhoe/Truck (5129 sf x 28')	5,319 cy	499.900 cy / cd	383	1,410.06 /cd	15,003	-	-	-	-	6.58	35,020	-	-	50,024	79,481
				31.10 Structure Excavation	5,319 cy		383		15,003					6.58	35,020			50,024	79,481
			31.12	Structure Backfill															
				Backfill Earth-Backhoe/Truck	1,648 cy	0.002 cd / cy	107	1,327.72 /cd	4,420	-	-	-	-	4.69	7,724	-	-	12,144	19,288
				31.12 Structure Backfill	1,648 cy		107		4,420					4.69	7,724			12,144	19,288
			31.13	Soil Disposal															
				Spoils to Waste	3,671 cy	0.003 day / cy	330	1,410.06 /day	12,943	-	-	-	-	8.23	30,214	-	-	43,157	68,572
				31.13 Soil Disposal	3,671 cy		330		12,943					8.23	30,214			43,157	68,572
			31.20	Structure Stone Base															
				Structure Subbase Stone-Loaders/Truck - 41895 sf x 4"	80 cy	0.003 cd / cy	10	1,609.56 /cd	390	28.28	2,262	-	-	10.02	801	-	-	3,454	5,327
				31.20 Structure Stone Base	80 cy		10		390	28.28	2,262			10.02	801			3,454	5,327
				49 Concrete Clearwell Construction	3,540 gsf		8,272		333,536	160.23	567,214	68.24	241,585	27.95	98,948			1,241,283	1,912,897
50				UV Facility															
			03.00	Foundation Mat															
				Keyway 6"	340 lf	0.050 mh / lf	17	39.49 /mh	671	0.67	229	-	-	-	-	-	-	900	1,410
				Mat Foundation Edge Form 30"	850 sf	0.350 mh / sf	298	39.49 /mh	11,750	1.31	1,116	-	-	-	-	-	-	12,866	20,290
				Waterstop 6" Flat	340 lf	0.110 mh / lf	37	39.18 /mh	1,466	2.10	714	-	-	-	-	-	-	2,180	3,403
				Strip & Oil Mat Found. Form	850 sf	0.005 mh / sf	4	39.17 /mh	166	0.03	26	-	-	-	-	-	-	192	302
				Rebar- Foundation Mat (100 #/cy)	33 tn	28.006 mh / tn	928	43.53 /mh	40,410	997.70	33,074	-	-	-	-	-	-	73,484	114,154
				Rebar Support - bricks (.12/sf)	859 ea	0.002 mh / ea	2	43.53 /mh	75	0.26	226	-	-	-	-	-	-	300	461
				Finish- Hard Trowel	7,156 sf	0.023 mh / sf	165	39.17 /mh	6,448	-	-	-	-	-	-	-	-	6,448	10,205
				Pump Place Mat Foundation 30"	663 cy	0.500 mh / cy	332	41.39 /mh	13,720	-	-	-	-	4.59	3,042	-	-	16,762	26,557
				4000 psi Concrete	663 cy					142.00	94,146	-	-	-	-	-	-	94,146	142,887
				Liquid Curing Compounds	8,006 sf	0.003 mh / sf	24	39.17 /mh	941	0.06	471	-	-	-	-	-	-	1,412	2,204
				6 Mil. Vapor Barrier	16,700 sf	0.002 mh / sf	33	43.53 /mh	1,454	0.05	877	-	-	-	-	-	-	2,331	3,632
				03.00 Foundation Mat	663 cy		1,840		77,101	197.40	130,877			4.59	3,042			211,020	325,505
			03.03	Columns															
				Form Rectangle Columns 9.33'	672 sf	0.165 mh / sf	111	39.49 /mh	4,378	1.60	1,073	-	-	-	-	-	-	5,451	8,558
				Form Rectangle Columns 26"	2,288 sf	0.165 mh / sf	378	39.49 /mh	14,908	1.60	3,652	-	-	-					

WBS Lvl 1	WBS Lvl 2	WBS Lvl 3	WBS Lvl 4	Description	Takeoff Quantity	Labor Productivity	Man Hours	Labor Price	Labor Amount	Material Cost/Unit	Material Amount	Subcontract Cost/Unit	Subcontract Amount	Const Equip Cost/Unit	Const Equip Amount	Process Equip Cost/Unit	Process Equip Amount	Total Amount	Grand Total Amount
			03.04	Walls															
				Finish- Top of Wall	376 sf	0.008 mh / sf	3	39.17 /mh	118	-	-	-	-	-	-	-	-	118	187
				Pump Place Foundation Walls 24"	237 cy	1.150 mh / cy	273	41.39 /mh	11,283	-	-	-	-	6.65	1,576	-	-	12,859	20,366
				Pump Place Brick Ledge	1 cy	2.001 mh / cy	2	41.39 /mh	83	-	-	-	-	14.42	14	-	-	97	154
				4000 psi Concrete	238 cy			/cy		142.00	33,796	-	-	-	-	-	-	33,796	51,293
				Grind/Patch Walls	6,392 sf	0.013 mh / sf	83	39.17 /mh	3,255	0.03	192	-	-	-	-	-	-	3,447	5,443
				Rub Walls	3,196 sf	0.058 mh / sf	185	39.17 /mh	7,260	0.06	192	-	-	-	-	-	-	7,452	11,782
				Liquid Curing Compounds	6,392 sf	0.002 mh / sf	13	39.17 /mh	501	0.06	376	-	-	-	-	-	-	877	1,363
				03.04 Walls	238 cy		2,172		87,255	283.79	67,543			6.68	1,590			156,388	243,142
			03.07	Suspended Beams															
				Beam Side Forms	3,181 sf	0.210 mh / sf	668	39.49 /mh	26,384	2.21	7,016	-	-	-	-	-	-	33,399	52,405
				Beam Bottom Forms	1,060 sf	0.210 mh / sf	223	39.49 /mh	8,792	2.21	2,338	-	-	-	-	-	-	11,130	17,463
				Chamfer	2,120 lf	0.015 mh / lf	32	39.49 /mh	1,256	0.57	1,202	-	-	-	-	-	-	2,458	3,813
				Strip & Oil Beam Forms	4,241 sf	0.005 mh / sf	21	39.17 /mh	831	0.03	127	-	-	-	-	-	-	958	1,508
				Superplasticizers @ Beams	118 cy			/cy		8.40	991	-	-	-	-	-	-	991	1,505
				Rebar- Beams (250 #/cy)	15 tn	15.003 mh / tn	221	43.53 /mh	9,632	997.70	14,716	-	-	-	-	-	-	24,348	37,580
				Finish- Top of Beam	1,060 sf	0.008 mh / sf	8	39.17 /mh	332	-	-	-	-	-	-	-	-	332	526
				Pump Place Beams @ Roof	118 cy	2.001 mh / cy	236	41.39 /mh	9,773	-	-	-	-	14.42	1,702	-	-	11,474	18,176
				4000 psi Concrete	118 cy			/cy		142.00	16,756	-	-	-	-	-	-	16,756	25,431
				Grind/Patch Beams	4,241 sf	0.013 mh / sf	55	39.17 /mh	2,160	0.03	127	-	-	-	-	-	-	2,287	3,612
				Rub Beams	4,241 sf	0.085 mh / sf	360	39.17 /mh	14,119	0.06	254	-	-	-	-	-	-	14,374	22,733
				Liquid Curing Compounds	5,301 sf	0.002 mh / sf	11	39.17 /mh	415	0.06	312	-	-	-	-	-	-	727	1,130
				03.07 Suspended Beams	118 cy		1,836		73,694	371.52	43,840			14.42	1,702			119,235	185,880
			03.08	Pads & Curbs															
				Roof Parapet Curb Forms 48" h	3,876 sf	0.200 mh / sf	775	39.49 /mh	30,617	1.52	5,902	-	-	-	-	-	-	36,520	57,417
				Chamfer	968 lf	0.015 mh / lf	15	39.49 /mh	573	0.57	549	-	-	-	-	-	-	1,122	1,741
				Strip & Oil Equipment Curb Forms	3,876 sf	0.005 mh / sf	19	39.17 /mh	759	0.03	116	-	-	-	-	-	-	876	1,378
				Rebar- Pads (100 #/cy)	4 tn	18.004 mh / tn	65	43.53 /mh	2,821	997.70	3,592	-	-	-	-	-	-	6,413	9,916
				Finish- Float	484 sf	0.017 mh / sf	8	39.17 /mh	322	-	-	-	-	-	-	-	-	322	510
				Pump Place Curbs 12"	72 cy	2.501 mh / cy	180	41.39 /mh	7,452	-	-	-	-	9.86	710	-	-	8,161	12,923
				4000 psi Concrete	72 cy			/cy		142.00	10,224	-	-	-	-	-	-	10,224	15,517
				Liquid Curing Compounds	4,360 sf	0.003 mh / sf	13	39.17 /mh	512	0.06	256	-	-	-	-	-	-	769	1,200
				03.08 Pads & Curbs	72 cy		1,075		43,057	286.66	20,640			9.86	710			64,407	100,602
			03.09	Pan Stair Fill															
				Finish Stairs	562 sf	0.055 mh / sf	31	39.17 /mh	1,211	-	-	-	-	-	-	-	-	1,211	1,916
				Pump Place Pan Stair Concrete	4 cy	3.001 mh / cy	12	41.39 /mh	497	-	-	-	-	9.18	37	-	-	533	845
				3000 psi Concrete	4 cy				-	138.00	552	-	-	-	-	-	-	552	838
				03.09 Pan Stair Fill	4 cy		43		1,708	138.00	552			9.18	37			2,296	3,599
			05.01	Misc Metals															
				Work Platform Frame & Floor Grating Structural Support (13 #/sf)	1 tn	8.002 ch / tn	40	214.54 /ch	1,734	1,200.25	1,212	-	-	829.21	838	-	-	3,784	5,917
				Metal Stairs Concrete Pans	63 rs	0.067 mh / rs	4	42.08 /mh	177	80.02	5,041	-	-	-	-	-	-	5,218	7,931
				Metal Stairs Grating Type	18 rs	1.000 mh / rs	18	42.08 /mh	758	367.57	6,616	-	-	-	-	-	-	7,374	11,241
				Alum. Stair Wall Handrail	32 lf	0.150 mh / lf	5	42.08 /mh	202	16.80	538	-	-	-	-	-	-	740	1,136
				Aluminum 3 Line Rail	84 lf	0.234 mh / lf	20	42.08 /mh	827	44.11	3,705	-	-	-	-	-	-	4,532	6,933
				Aluminum Handrail @ Work Platform	60 lf	0.234 mh / lf	14	42.08 /mh	591	44.11	2,647	-	-	-	-	-	-	3,237	4,952
				Aluminum Handrail @ Pan Stairs	92 lf	0.234 mh / lf	22	42.08 /mh	906	44.11	4,058	-	-	-	-	-	-	4,964	7,593
				Alum Grate Cover .75" @ 4'x4' Sump	2 ea	0.600 mh / ea	1	42.08 /mh	51	185.04	370	-	-	-	-	-	-	421	642
				Alum Grating Work Platform @ UV Reactor 12' x 6.5' x 5' h, 2 ea	156 sf	0.035 mh / sf	5	42.08 /mh	230	12.39	1,933	-	-	-	-	-	-	2,163	3,298
				Alum Grating Banding	74 lf			/lf		23.70	1,754	-	-	-	-	-	-	1,754	2,662
				Aluminum Hatch & Frame Over Pipe Gallery 6.33' x 6.33'	0 ea	8.000 mh / ea	0	39.18 /mh	3	5,001.00	50	-	-	-	-	-	-	53	81
				05.01 Misc Metals	1 ls		129		5,478	27,924.05	27,924			837.50	838			34,240	52,384
			06.00	Wood															
				Misc Nailers & Blocking	7,071 sf	0.010 mh / sf	71	39.67 /mh	2,806	0.40	2,838	-	-	-	-	-	-	5,644	8,748
				PT Roof Blocking @ Top Of Masonry Wall	332 lf	0.035 mh / lf	12	39.67 /mh	461	1.82	604	-	-	-	-	-	-	1,065	1,647
				PT Roof Blocking @ Skylight Curb	156 lf	0.035 mh / lf	5	39.67 /mh	217	1.82	284	-	-	-	-	-	-	500	774
				06.00 Wood	1 ls		88		3,483	3,725.66	3,726							7,209	11,168
			07.00	Moisture Protection															
				Caulking @ Masonry Wall Joints- Exterior (.09 lf/sf)	1,223 lf			/lf				4.00	4,893	-	-	-	-	4,893	7,426
				Caulking @ Masonry Wall Joints- Interior	1,021 lf			/lf				4.00	4,085	-	-	-	-	4,085	6,200
				07.00 Moisture Protection	1 ls							8,977.80	8,978					8,978	13,626
			07.01	Roofing															
				Membrane Roofing- 60 mil EPDM Mechanically Attached w/ 3" Insulation	5,800 sf			/sf				3.00	17,403	-	-	-	-	17,403	26,414
				Aluminum Downspouts, 2 ea x 32" each	64 vf			/vf				18.00	1,152	-	-	-	-	1,152	1,749
				Scuppers	2 ea			/ea				50.01	100	-	-	-	-	100	152
				Aluminum Coping @ Roof Parapet 12" wide	332 lf			/lf				15.00	4,981	-	-	-	-	4,981	7,560
				Translucent Panel Skylight Frame & Panels	1,398 sf			/sf				38.01	53,135	-	-	-	-	53,135	80,643
				07.01 Roofing	1 sf							76,771.31	76,771					76,771	116,517
			08.00	Doors, Frames & Hardware															
				HM Single Frames- 16 ga 3'x7"	5 ea	1.000 mh / ea	5	39.18 /mh	196	180.04	900	-	-	-	-	-	-	1,096	1,676
				HM Double Frames- 16 ga. 6'x7"	1 ea	1.500 mh / ea	2	39.18 /mh	59	210.00	210	-	-	-	-	-	-	269	412
				HM Door Leafs- 3'x7' 20 ga. half glass	7 ea	1.500 ea / mh	5	39.18 /mh	183	450.09	3,151	-	-	-	-				

WBS Lvl 1	WBS Lvl 2	WBS Lvl 3	WBS Lvl 4	Description	Takeoff Quantity	Labor Productivity	Man Hours	Labor Price	Labor Amount	Material Cost/Unit	Material Amount	Subcontract Cost/Unit	Subcontract Amount	Const Equip Cost/Unit	Const Equip Amount	Process Equip Cost/Unit	Process Equip Amount	Total Amount	Grand Total Amount
				23.00 HVAC	1 sf							318,195.00	318,195					318,195	482,930
			26.00	UG Electrical															
				Building Electrical System	7,071 sf	/sf						16.00	113,159					113,159	171,743
				26.00 UG Electrical	1 ls							113,158.59	113,159					113,159	171,743
			26.01	Above Ground Electrical															
				Building Electrical System	7,071 sf	/sf						8.00	56,579					56,579	85,871
				Process Electrical System	7,071 sf	/sf						30.01	212,172					212,172	322,017
				26.01 Above Ground Electrical	1 ls							268,751.64	268,752					268,752	407,889
			26.02	Instrumentation & Controls															
				Controls & Instrumentation	1 ls	/ls						366,278.00	366,278					366,278	555,906
				26.02 Instrumentation & Controls	1 ls							366,278.00	366,278					366,278	555,906
			31.01	Dewatering															
				Remove Dewatering System	1 ls	2.000 cd / ls	96	2,249.33 /cd	4,499			227.27	227	1,295.68	1,296			6,022	9,527
				24" Wells, well casing, pea gravel	35 lf	/lf						150.00	5,250					5,250	7,968
				Set & Wire Pumps	1 ea	2.000 ea / cd	24	2,249.33 /cd	1,125	25,000.00	25,000			323.92	324			26,449	40,238
				Maintenance/Operation	1 ea	1.000 ea / cd	48	2,249.33 /cd	2,249	1,000.00	1,000			647.84	648			3,897	6,109
				Suction Piping	80 lf	110.000 lf / cd	35	2,249.33 /cd	1,636	15.00	1,200			5.89	471			3,307	5,160
				Header Piping	200 lf	200.000 lf / cd	48	2,249.33 /cd	2,249	35.00	7,000			3.24	648			9,897	15,215
				Valving	1 ls	1.000 ls / cd	48	2,249.33 /cd	2,249	5,000.00	5,000			647.84	648			7,897	12,180
				Run Temp Power to Pumps	1 ea	1.000 ea / cd	32	1,439.45 /cd	1,439	2,000.00	2,000			226.08	226			3,666	5,673
				Electric Consumption	4 mo	1.000 mo / ls		/ls		1,000.00	4,000							4,000	6,071
				31.01 Dewatering	1 ls		331		15,447	45,200.00	45,200	5,477.27	5,477	4,260.36	4,260			70,384	108,142
			31.02	Piles															
				Augered Piles CIP 18" x @ 25 ft depth, 10' oc = 104 ea (1 per 68 sf)	2,600 vf	0.002 cd / vf	291	2,146.97 /cd	11,166	35.16	91,407			2.58	6,709			109,282	167,079
				31.02 Piles	104 ea		291		11,166	878.91	91,407			64.51	6,709			109,282	167,079
			31.03	Excavation Shoring															
				Shoring System Design Engineer	1 ls							15,002.99	15,003					15,003	22,770
				Structure Sheeting (87' x 22' deep)	1,914 sf	0.001 cd / sf	94	2,465.38 /cd	3,633	16.00	30,630			0.75	1,440			35,704	54,531
				Tie Backs (1 per 80 sf of Sheeting, 87' x 18'= 1566 sf)	20 ea							2,377.48	47,549					47,549	72,167
				31.03 Excavation Shoring	1,914 sf		94		3,633	16.00	30,630	32.68	62,552	0.75	1,440			98,256	149,468
			31.10	Structure Excavation															
				Exc Clay-Backhoe/Truck (7,310 sf x 18.33')	4,963 cy	499.900 cy / cd	357	1,410.06 /cd	13,999					6.58	32,676			46,676	74,162
				31.10 Structure Excavation	4,963 cy		357		13,999					6.58	32,676			46,676	74,162
			31.12	Structure Backfill															
				Backfill Earth-Backhoe/Truck (87' x 4' x 18.33')	236 cy	0.002 cd / cy	15	1,327.72 /cd	633					4.69	1,106			1,739	2,762
				31.12 Structure Backfill	236 cy		15		633					4.69	1,106			1,739	2,762
			31.13	Soil Disposal															
				Spoils to Waste	4,727 cy	0.003 day / cy	426	1,410.06 /day	16,667					8.23	38,905			55,572	88,297
				31.13 Soil Disposal	4,727 cy		426		16,667					8.23	38,905			55,572	88,297
			31.20	Structure Stone Base															
				Structure Subbase Stone-Loaders/Truck - 7,310 sf x 4'	90 cy	0.003 cd / cy	11	1,609.56 /cd	439	28.28	2,545			10.02	901			3,886	5,992
				31.20 Structure Stone Base	90 cy		11		439	28.28	2,545			10.02	901			3,886	5,992
			40.00	Under Ground Process Piping															
				Trench Excav & Lay Pipe 0-4'	28 lf	600.000 lf / cd	3	2,539.31 /cd	119					1.88	53			171	272
				Stone Pipe Bedding	5 cy	200.000 cy / cd	2	2,896.43 /cd	72	23.29	116							189	291
				Hydrostatic Testing	28 lf	0.021 ch / lf	2	182.49 /ch	107	0.16	4							112	177
				Gasket/Nuts/Bolt Kit 36"	6 ea	3.001 mh / ea	18	45.62 /mh	821	225.05	1,350							2,172	3,349
				DI Flanged Joint Pipe 36"	28 lf	3.471 mh / lf	97	45.62 /mh	4,434	426.62	11,945							16,379	25,147
				DI Flanged Tee 36"	4 ea	20.524 mh / ea	82	45.62 /mh	3,745	19,000.00	76,000							79,745	121,274
				DI Blind Flange 36"	1 ea	19.230 mh / ea	19	45.62 /mh	877	3,840.90	3,841							4,718	7,218
				40.00 Under Ground Process Piping	1 lf		223		10,176	93,257.54	93,258			52.74	53			103,486	157,728
			40.01	Above Ground Process Piping															
				Paint & Stencil Exposed Piping >20"	204 lf							25.01	5,101					5,101	7,742
				Paint & Stencil Exposed Piping <20"	800 lf							10.00	8,002					8,002	12,144
				Pipe Supports	17 ea	4.001 mh / ea	68	45.62 /mh	3,103	250.05	4,251							7,354	11,363
				DI RJ Std Wgt Cap 36"	1 ea	5.068 mh / ea	5	45.62 /mh	231	4,020.80	4,021							4,252	6,468
				Hydrostatic Testing	204 lf	0.021 ch / lf	17	182.49 /ch	782	0.16	33							815	1,287
				Dresser Couplings 36"	4 ea	20.804 mh / ea	83	45.62 /mh	3,797	1,270.26	5,081							8,878	13,720
				36" DI Wall Thimble 24" long	1 ea	5.001 ch / ea	20	182.49 /ch	913	1,286.25	1,286			1,200.15	1,200			3,399	5,307
				Gasket/Nuts/Bolt Kit 30"	4 ea	2.501 mh / ea	10	45.62 /mh	456	175.04	700							1,156	1,785
				Gasket/Nuts/Bolt Kit 36"	14 ea	3.001 mh / ea	42	45.62 /mh	1,917	225.05	3,151							5,067	7,815
				Gasket/Nuts/Bolt Kit 48"	18 ea	1.000 mh / ea	18	45.62 /mh	821	425.09	7,652							8,473	12,913
				DI Flanged Joint Pipe 30"	6 lf	3.051 mh / lf	18	45.62 /mh	835	310.21	1,861							2,696	4,147
				DI Flanged Joint Pipe 36"	70 lf	3.471 mh / lf	243	45.62 /mh	11,084	426.62	29,864							40,947	62,867
				DI Flanged Joint Pipe 48"	128 lf	4.371 mh / lf	559	45.62 /mh	25,524	711.68	91,096							116,620	178,655
				DI Flanged 90 ell 30"	5 ea	17.874 mh / ea	89	45.62 /mh	4,077	2,317.06	11,585							15,662	24,036
				DI Flanged 90 ell 48"	4 ea	25.715 mh / ea	103	45.62 /mh	4,693	6,635.22	26,541							31,234	47,709
				DI Flanged Tee 36"	4 ea	20.524 mh / ea	82	45.62 /mh	3,745	19,000.00	76,000							79,745	121,274
				DI Flanged Tee 48"	4 ea	25.715 mh / ea	103	45.62 /mh	4,693	24,821.92	99,288							103,980	158,118
				DI Flanged Con Red 48x32"	4 ea	25.715 mh / ea	103	45.62 /mh	4,693	9,913.98	39,656							44,349	67,614
				DI Flanged Con Red 48x36"	2 ea	25.715 mh / ea	51	45.62 /mh											

WBS Lvl 1	WBS Lvl 2	WBS Lvl 3	WBS Lvl 4	Description	Takeoff Quantity	Labor Productivity	Man Hours	Labor Price	Labor Amount	Material Cost/Unit	Material Amount	Subcontract Cost/Unit	Subcontract Amount	Const Equip Cost/Unit	Const Equip Amount	Process Equip Cost/Unit	Process Equip Amount	Total Amount	Grand Total Amount
				41.22 Hoists & Cranes	1 ea		202		7,988	21,339.87	21,340			4,145.00	4,145	110,000.00	110,000	143,473	218,577
			43.07	UV Disinfection Equipment															
				Centrifugal Blowers, 51-100 hp (Air Scour Blowers 1-4)	4 ea	40.008 mh / ea	160	47.77 /mh	7,645	1,500.30	6,001			150,029.95	600,120			613,766	976,309
				UV Reactor #1, 2, 3 & 4	4 ea	60.012 mh / ea	240	45.62 /mh	10,951	5,001.00	20,004					250,950.00	1,003,800	1,034,755	1,571,176
				43.07 UV Disinfection Equipment	1 ls		400		18,597	26,005.19	26,005			600,119.78	600,120	1,003,800.00	1,003,800	1,648,522	2,547,485
				50 UV Facility	7,071 gsf		12,704		529,755	189.02	1,336,541	185.89	1,314,406	98.97	699,838	157.52	1,113,800	4,994,341	7,666,071
			51	Oxidation System															
			03.08	Pads & Curbs															
				Pad Form 14"	447 sf	0.160 mh / sf	72	39.49 /mh	2,825	1.37	610							3,435	5,397
				LOX Tank Pad Form 24"	288 sf	0.180 mh / sf	52	39.49 /mh	2,047	1.37	393							2,441	3,837
				LOX Vaporizer Pad Form 12"	78 sf	0.160 mh / sf	12	39.49 /mh	493	1.37	106							599	942
				Chamfer	821 lf	0.015 mh / lf	12	39.49 /mh	486	0.57	466							952	1,476
				Strip & Oil Equipment Pad Forms	222 sf	0.005 mh / sf	1	39.17 /mh	43	0.03	7							50	79
				Rebar- Pads (100 #/cy)	3 tn	18.004 mh / tn	59	43.53 /mh	2,586	997.70	3,292							5,878	9,090
				Finish- Float	1,321 sf	0.017 mh / sf	22	39.17 /mh	880	-	-							880	1,392
				Pump Place Pads 12" & 14"	27 cy	1.600 mh / cy	43	41.39 /mh	1,788	-	-			7.49	202			1,991	3,152
				Pump Place Pads 24"	32 cy	1.600 mh / cy	51	41.39 /mh	2,120	-	-			7.49	240			2,359	3,736
				4000 psi Concrete	59 cy			/cy		142.00	8,378							8,378	12,715
				Liquid Curing Compounds	1,543 sf	0.003 mh / sf	5	39.17 /mh	181	0.06	91							272	425
				03.08 Pads & Curbs	59 cy		330		13,450	226.16	13,343			7.49	442			27,235	42,242
			26.01	Above Ground Electrical															
				Electrical Work For Equipment (5% Equipment Cost)	1 ls			/ls				42,977.00	42,977					42,977	65,227
				26.01 Above Ground Electrical	1 ls							42,977.00	42,977					42,977	65,227
			26.02	Instrumentation & Controls															
				Controls & Instrumentation Work For New Equipment (1.5% Equipment Cost)	1 ls			/ls				12,893.00	12,893					12,893	19,568
				26.02 Instrumentation & Controls	1 ls							12,893.00	12,893					12,893	19,568
			32.01	Fencing & Gates															
				8' Chain Link Fence @ LOX Tanks	125 lf							31.01	3,876					3,876	5,882
				8' Fence Vehicle Gate 12' @ LOX Tanks	1 ea							1,700.34	1,700					1,700	2,581
				32.01 Fencing & Gates	1 ls							5,576.11	5,576					5,576	8,463
			40.01	Above Ground Process Piping															
				Process Piping Work For Equipment (10% Equipment Cost)	1 ls			/ls				86,000.00	86,000					86,000	130,524
				40.01 Above Ground Process Piping	1 lf							86,000.00	86,000					86,000	130,524
			43.17	LOX Equipment															
				Vaporizer 9'x9'x20' h, 6,000 lbs (Charter/Thermax #SG500)	1 ea	1.000 cd / ea	40	1,783.17 /cd	1,783					763.22	763	209,000.00	209,000	211,546	321,239
				High Pressure Tank 10,960 gal, 9.5'dia.x34' h, 46,700 lbs (Charter #VS-11000SC)	1 ea	1.000 cd / ea	40	1,783.17 /cd	1,783	2,000.00	2,000			763.22	763	219,000.00	219,000	223,546	339,452
				Tanks - Unload	1 mh		1	47.77 /mh	48									48	76
				Tanks - Move-Uncrate	1 mh		1	47.77 /mh	48									48	76
				Tanks - Set-Grout	1 mh		1	47.77 /mh	48									48	76
				Tank Water 10000 Gal	1 ea	1.000 mh / ea	1	47.77 /mh	48	13,450.00	13,450					7,200.00	7,200	20,698	31,416
				Carbon Dioxide Storage & Feed System (10MGD), 50ton liquid CO2 storage, feed panel, vaporizers, heater, regulator, diffusers, controls	1 ea	1.000 mh / ea	1	42.40 /mh	42							403,565.00	403,565	403,607	612,564
				43.17 LOX Equipment	1 ls		85		3,800	15,450.00	15,450			1,526.44	1,526	838,765.00	838,765	859,541	1,304,899
				51 Oxidation System	1 ls		415		17,250	28,793.39	28,793	147,446.11	147,446	1,968.46	1,968	838,765.00	838,765	1,034,223	1,570,922
				5C New Small Clearwell & UV w/ Oxidation	1 ls		21,391		880,540	1,932,548.42	1,932,548	1,703,437.93	1,703,438	800,755.24	800,755	1,952,565.00	1,952,565	7,269,847	11,149,891
				05 Clearwell	1 ls		95,656		3,894,475	7,164,998.87	7,164,999	3,972,250.14	3,972,250	2,403,706.20	2,403,706	3,066,365.00	3,066,365	20,501,796	31,546,429

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06				High Service Pump Station															
	6A			High Service Pump Station (Retrofit)															
		43		Process Equipment															
			43.00	Pumps															
				Pump Inspection	5 ea	24.000 mh / ea	120	42.40 /mh	5,087	-	-	2,200.00	-	-	-	-	-	16,087	24,747
				HSPS Vert Turbine Can Pump - 1250 hp	5 ea	240.000 mh / ea	1,200	47.77 /mh	57,329	2,500.00	12,500	-	-	-	-	562,500.00	2,812,500	2,882,329	4,378,282
				43.00 Pumps	1 ls		1,320		62,416	12,500.00	12,500	11,000.00	11,000			2,812,500.00	2,812,500	2,898,416	4,403,029
				43 Process Equipment	1 ls		1,320		62,416	12,500.00	12,500	11,000.00	11,000			2,812,500.00	2,812,500	2,898,416	4,403,029
				6A High Service Pump Station (Retrofit)	1 ls		1,320		62,416	12,500.00	12,500	11,000.00	11,000			2,812,500.00	2,812,500	2,898,416	4,403,029
	6B			High Service Pump Station (New)															
		00		Building & Structure Construction															
			03.00	Foundation Mat															
				Keyway 6"	504 lf	0.050 mh / lf	25	39.49 /mh	995	0.67	339	-	-	-	-	-	-	1,334	2,089
				Mat Foundation Edge Form 12"	260 sf	0.350 mh / sf	91	39.49 /mh	3,594	1.31	341	-	-	-	-	-	-	3,935	6,207
				Mat Foundation Edge Form 30"	1,870 sf	0.350 mh / sf	655	39.49 /mh	25,850	1.31	2,455	-	-	-	-	-	-	28,305	44,639
				Waterstop 6" Flat	504 lf	0.110 mh / lf	55	39.18 /mh	2,172	2.10	1,059	-	-	-	-	-	-	3,231	5,045
				Strip & Oil Mat Found. Form	2,130 sf	0.005 mh / sf	11	39.17 /mh	417	0.03	64	-	-	-	-	-	-	481	757
				Rebar- Foundation Mat (100 #/cy)	17 tn	28.006 mh / tn	489	43.53 /mh	21,272	997.70	17,410	-	-	-	-	-	-	38,681	60,090
				Rebar Support - bricks (.12/sf)	608 ea	0.002 mh / ea	1	43.53 /mh	53	0.26	160	-	-	-	-	-	-	213	326
				Finish- Hard Trowel	5,067 sf	0.023 mh / sf	117	39.17 /mh	4,565	-	-	-	-	-	-	-	-	4,565	7,226
				Pump Place Mat Foundation 12"	81 cy	0.500 mh / cy	41	41.39 /mh	1,676	-	-	-	-	4.59	372	-	-	2,048	3,245
				Pump Place Mat Foundation 30"	268 cy	0.500 mh / cy	134	41.39 /mh	5,546	-	-	-	-	4.59	1,230	-	-	6,776	10,735
				Pump Place Thickened Mat 36" x 12"	14 cy	0.500 mh / cy	7	41.39 /mh	290	-	-	-	-	4.59	64	-	-	354	561
				4000 psi Concrete	363 cy					142.00	51,546	-	-	-	-	-	-	51,546	78,232
				Liquid Curing Compounds	7,197 sf	0.003 mh / sf	22	39.17 /mh	846	0.06	423	-	-	-	-	-	-	1,269	1,981
				6 Mil. Vapor Barrier	5,600 sf	0.002 mh / sf	11	43.53 /mh	488	0.05	294	-	-	-	-	-	-	782	1,218
				03.00 Foundation Mat	363 cy		1,658		67,765	204.11	74,090			4.59	1,665			143,520	222,351
			03.03	Columns															
				Form Rectangle Columns 9.33' & 9.58'	1,128 sf	0.165 mh / sf	186	39.49 /mh	7,350	1.60	1,801	-	-	-	-	-	-	9,150	14,365
				Chamfer	565 lf	0.015 mh / lf	8	39.49 /mh	335	0.57	320	-	-	-	-	-	-	655	1,016
				Strip & Oil Column Form	1,128 sf	0.005 mh / sf	6	39.17 /mh	221	0.03	34	-	-	-	-	-	-	255	401
				Superplasticizers @ Columns	21 cy					8.40	176	-	-	-	-	-	-	176	268
				Column Rebar (120 #/cy)	1 tn	20.004 mh / tn	25	43.53 /mh	1,097	997.70	1,257	-	-	-	-	-	-	2,354	3,644
				Finish- Float	44 sf	0.017 mh / sf	1	39.17 /mh	29	-	-	-	-	-	-	-	-	29	46
				Pump Place Columns 15 ea	21 cy	1.600 mh / cy	34	41.39 /mh	1,391	-	-	-	-	7.50	157	-	-	1,548	2,452
				4000 psi Concrete	21 cy					142.00	2,982	-	-	-	-	-	-	2,982	4,526
				Grind/Patch Columns	1,128 sf	0.013 mh / sf	15	39.17 /mh	574	0.03	34	-	-	-	-	-	-	608	961
				Rub Columns	1,128 sf	0.065 mh / sf	73	39.17 /mh	2,872	0.06	68	-	-	-	-	-	-	2,939	4,648
				Liquid Curing Compounds	1,128 sf	0.003 mh / sf	3	39.17 /mh	133	0.06	66	-	-	-	-	-	-	199	310
				03.03 Columns	21 cy		351		14,001	320.87	6,738			7.50	157			20,897	32,637
			03.04	Walls															
				Brick Ledge Forms	161 sf	0.300 mh / sf	48	39.49 /mh	1,908	2.21	355	-	-	-	-	-	-	2,263	3,558
				Keyway 6"	327 lf	0.050 mh / lf	16	39.49 /mh	646	0.67	220	-	-	-	-	-	-	866	1,356
				Vertical Wall Keyway 6"	95 lf	0.110 mh / lf	10	39.49 /mh	413	0.67	64	-	-	-	-	-	-	477	750
				Panel Form System 16" h	10,450 sf	0.190 mh / sf	1,986	39.49 /mh	78,419	1.84	19,206	-	-	-	-	-	-	97,625	153,264
				Wall Box Out For Weir, 34 lf	140 sf	0.550 mh / sf	77	39.49 /mh	3,041	1.34	188	-	-	-	-	-	-	3,229	5,099
				Waterstop 6" Flat	422 lf	0.110 mh / lf	46	39.18 /mh	1,819	2.10	886	-	-	-	-	-	-	2,705	4,224
				Strip & Oil Wall Forms	10,450 sf	0.005 mh / sf	52	39.17 /mh	2,047	0.03	314	-	-	-	-	-	-	2,360	3,715
				Superplasticizers @ Walls	398 cy					8.40	3,344	-	-	-	-	-	-	3,344	5,075
				Rebar- Walls (125 #/cy)	25 tn	15.003 mh / tn	375	43.53 /mh	16,326	997.70	24,943	-	-	-	-	-	-	41,268	63,695
				Finish- Top of Wall	474 sf	0.008 mh / sf	4	39.17 /mh	149	-	-	-	-	-	-	-	-	149	235
				Pump Place Walls 24"	350 cy	1.150 mh / cy	403	41.39 /mh	16,662	-	-	-	-	6.65	2,327	-	-	18,990	30,076
				Pump Place Walls 30"	47 cy	1.150 mh / cy	54	41.39 /mh	2,238	-	-	-	-	6.65	313	-	-	2,550	4,039
				Pump Place Brick Ledge	1 cy	2.001 mh / cy	2	41.39 /mh	83	-	-	-	-	14.42	14	-	-	97	154
				4000 psi Concrete	398 cy					142.00	56,516	-	-	-	-	-	-	56,516	85,775
				Grind/Patch Walls	10,450 sf	0.013 mh / sf	136	39.17 /mh	5,322	0.03	314	-	-	-	-	-	-	5,635	8,899
				Rub Walls	5,225 sf	0.058 mh / sf	303	39.17 /mh	11,870	0.06	314	-	-	-	-	-	-	12,183	19,262
				Liquid Curing Compounds	10,450 sf	0.002 mh / sf	21	39.17 /mh	819	0.06	615	-	-	-	-	-	-	1,433	2,229
				03.04 Walls	396 cy		3,534		141,760	270.90	107,276			6.70	2,654			251,690	391,404
			03.06	Suspended Flat Slab															
				Form Suspended Slab Bottom	6,383 sf	0.180 mh / sf	1,149	39.49 /mh	45,378	2.18	13,943	-	-	-	-	-	-	59,322	92,983
				Slab Edge Form 12"	660 sf	0.250 mh / sf	165	39.49 /mh	6,517	5.17	3,413	-	-	-	-	-	-	9,930	15,494
				Strip & Oil Suspended Slab Forms	7,043 sf	0.005 mh / sf	35	39.17 /mh	1,380	0.04	289	-	-	-	-	-	-	1,668	2,622
				Superplasticizers	236 cy					8.40	1,983	-	-	-	-	-	-	1,983	3,009
				Rebar- Suspended Slab (225 #/cy)	27 tn	20.004 mh / tn	531	43.53 /mh	23,117	997.70	26,489	-	-	-	-	-	-	49,606	76,791
				Finish- Hard Trowel	6,383 sf	0.030 mh / sf	192	39.17 /mh	7,502	-	-	-	-	-	-	-	-	7,502	11,873
				Pump Place Suspended Slab 12"	236 cy	1.800 mh / cy	425	41.39 /mh	17,586	-	-	-	-	6.65	1,570	-	-	19,156	30,332
				4000 psi Concrete	236 cy					142.00	33,512	-	-	-	-	-	-	33,512	50,862
				Liquid Curing Compounds	14,086 sf	0.003 mh / sf	42	39.17 /mh	1,655	0.68	9,616	-	-	-	-	-	-	11,271	17,214
				03.06 Suspended Flat Slab	236 cy		2,539		103,135	378.15	89,244			6.65	1,570			193,949	301,180
			03.07	Suspended Beams															

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			03.08	Pads & Curbs																
				Pump Place Curbs 12"	11 cy	2.501 mh / cy	28	41.39 /mh	1,138	-	-	-	-	9.86	108	-	-	1,247	1,974	
				Pump Place Pads 6"	2 cy	1.601 mh / cy	3	41.39 /mh	132	-	-	-	-	7.49	15	-	-	147	234	
				4000 psi Concrete	13 cy			/cy		142.00	1,846	-	-	-	-	-	-	1,846	2,802	
				Liquid Curing Compounds	1,321 sf	0.003 mh / sf	4	39.17 /mh	155	0.06	78	-	-	-	-	-	-	233	364	
				03.08 Pads & Curbs	13 cy		298		11,882	365.12	4,747			9.49	123			16,752	26,206	
			03.20	Precast Planks																
				Precast Hollow Core Roof Planks 4' wide x 10"	4,324 sf	0.020 mh / sf	86	42.24 /mh	3,654	8.80	38,059	-	-	0.35	1,522	-	-	43,234	65,967	
				03.20 Precast Planks	4,324 sf		86		3,654	8.80	38,059			0.35	1,522			43,234	65,967	
			04.00	Masonry																
				8" CMU + Rigid Insulation Backup To Brick, 17" h	2,302 sf			/sf		-	-	18.00	41,444	-	-	-	-	41,444	62,901	
				8" CMU Interior Partition 9.33' h	824 sf			/sf		-	-	14.00	11,538	-	-	-	-	11,538	17,512	
				Brick Veneer	2,448 sf					-	-	9.00	22,036	-	-	-	-	22,036	33,445	
				04.00 Masonry	3,272 sf							22.93	75,019					75,019	113,857	
			06.00	Wood																
				Misc Nailers & Blocking	5,025 sf	0.010 mh / sf	50	39.67 /mh	1,994	0.40	2,017	-	-	-	-	-	-	4,011	6,217	
				06.00 Wood	1 ls		50		1,994	2,016.69	2,017							4,011	6,217	
			07.01	Roofing																
				Membrane Roofing- 60 mil EPDM Mechanically Attached w/ 3" Insulation	5,100 sf			/sf		-	-	3.00	15,303	-	-	-	-	15,303	23,226	
				Aluminum Downspouts, 4 ea x 16' each	64 vf			/vf		-	-	18.00	1,152	-	-	-	-	1,152	1,749	
				Aluminum Coping @ Roof Parapet 20" wide	143 lf			/lf		-	-	25.01	3,576	-	-	-	-	3,576	5,427	
				Aluminum Gutters	114 lf			/lf		-	-	15.00	1,710	-	-	-	-	1,710	2,596	
				Roof Hatch 4'0" x 4'0"	3 ea			/ea		-	-	2,500.50	7,502	-	-	-	-	7,502	11,385	
				Translucent Panel Skylight Frame & Panels 7' x 7', 6 ea	294 sf			/sf		-	-	38.01	11,174	-	-	-	-	11,174	16,959	
				07.01 Roofing	5,100 sf							7.93	40,417					40,417	61,342	
			08.00	Doors, Frames & Hardware																
				HM Door Leafs- 3'x7' 20 ga. half glass	7 ea	1.500 ea / mh	5	39.18 /mh	183	450.09	3,151	-	-	-	-	-	-	3,334	5,071	
				Overhead Doors- 10'x10' 24 ga steel manual 1" insuation 26 ga back-up panel	1 ea					-	-	2,255.45	2,255	-	-	-	-	2,255	3,423	
				08.00 Doors, Frames & Hardware	8 ea		5		183	393.83	3,151	281.93	2,255					5,589	8,494	
			09.00	Finishes																
				Paint HM Door Frames - primer (2) coats	4 ea			/ea		-	-	100.02	400	-	-	-	-	400	607	
				Paint HM Doors - primer (2) coats	7 ea			/ea		-	-	140.03	980	-	-	-	-	980	1,488	
				Paint Walls- 3 coats	3,950 sf					-	-	0.94	3,713	-	-	-	-	3,713	5,635	
				09.00 Finishes	1 ls							5,093.27	5,093					5,093	7,730	
			10.00	Specialty Items																
				Signs - Building ID	1 ea			/ea		-	-	3,000.60	3,001	-	-	-	-	3,001	4,554	
				Signs - Doors	4 ea			/ea		-	-	30.01	120	-	-	-	-	120	182	
				Fire Extinguisher CO2 10 lbs	3 ea			/ea		-	-	225.05	675	-	-	-	-	675	1,025	
				10.00 Specialty Items	1 ls							3,795.76	3,796					3,796	5,761	
			22.00	Plumbing																
				Plumbing Subcontract	5,100 sf			/sf		-	-	6.00	30,606	-	-	-	-	30,606	46,451	
				22.00 Plumbing	1 ls							30,606.11	30,606					30,606	46,451	
			23.00	HVAC																
				Ventilation & Unit Heater System	5,100 sf			/sf		-	-	25.01	127,525	-	-	-	-	127,525	193,547	
				23.00 HVAC	5,100 sf							25.01	127,525					127,525	193,547	
			31.01	Dewatering																
				Remove Dewatering System	1 ls	2.000 cd / ls	96	2,249.33 /cd	4,499			227.27	227	1,295.68	1,296	-	-	6,022	9,527	
				24" Wells, well casing, pea gravel	35 lf			/lf		-	-	150.00	5,250	-	-	-	-	5,250	7,968	
				Set & Wire Pumps	1 ea	2.000 ea / cd	24	2,249.33 /cd	1,125	25,000.00	25,000	-	-	323.92	324	-	-	26,449	40,238	
				Maintenance/Operation	1 ea	1.000 ea / cd	48	2,249.33 /cd	2,249	1,000.00	1,000	-	-	647.84	648	-	-	3,897	6,109	
				Suction Piping	80 lf	110.000 lf / cd	35	2,249.33 /cd	1,636	15.00	1,200	-	-	5.89	471	-	-	3,307	5,160	
				Header Piping	200 lf	200.000 lf / cd	48	2,249.33 /cd	2,249	35.00	7,000	-	-	3.24	648	-	-	9,897	15,215	
				Valving	1 ls	1.000 ls / cd	48	2,249.33 /cd	2,249	5,000.00	5,000	-	-	647.84	648	-	-	7,897	12,180	
				Run Temp Power to Pumps	1 ea	1.000 ea / cd	32	1,439.45 /cd	1,439	2,000.00	2,000	-	-	226.08	226	-	-	3,666	5,674	
				Electric Consumption	4 mo	1.000 mo / ls		/ls		1,000.00	4,000	-	-	-	-	-	-	4,000	6,071	
				31.01 Dewatering	1 ls		331		15,447	45,200.00	45,200	5,477.27	5,477	4,260.36	4,260			70,384	108,142	
			31.02	Piles																
				Augered Piles CIP 18" x @ 25 ft depth, 10' oc = 79 ea (1 per 64 sf)	1,975 vf	0.002 cd / vf	221	2,146.97 /cd	8,482	35.16	69,434	-	-	2.58	5,096	-	-	83,012	126,917	
				31.02 Piles	79 ea		221		8,482	878.91	69,434			64.51	5,096			83,012	126,917	
			31.03	Excavation Shoring																
				Shoring System Design Engineer	1 ls					-	-	15,003.00	15,003	-	-	-	-	15,003	22,770	
				Structure Sheeting (149' x 22' deep)	3,278 sf	0.001 cd / sf	162	2,465.38 /cd	6,225	16.00	52,458	-	-	0.75	2,465	-	-	61,148	93,392	
				Tie Backs (1 per 80 sf of Sheeting, 149' x 18"= 2,682 sf)	34 ea					-	-	2,377.47	80,834	-	-	-	-	80,834	122,683	
				31.03 Excavation Shoring	3,278 sf		162		6,225	16.00	52,458	29.24	95,837	0.75	2,465			156,986	238,846	
			31.10	Structure Excavation																
				Exc Clay-Backhoe/Truck (5,440 sf x 17.83')	3,592 cy	499.900 cy / cd	259	1,410.06 /cd	10,132	-	-	-	-	6.58	23,650	-	-	33,782	53,675	
				31.10 Structure Excavation	3,592 cy		259		10,132					6.58	23,650			33,782	53,675	
			31.12	Structure Backfill																
				Backfill Earth-Backhoe/Truck (149' x 4' x 17.83')	383 cy	0.002 cd / cy	25	1,327.72 /cd	1,027	-	-	-	-	4.69	1,795	-	-	2,822	4,483	
				31.12 Structure Backfill	383 cy		25		1,027					4.69	1,795			2,822	4,483	
			31.13	Soil Disposal																

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			26.01	Above Ground Electrical																
				Process Electrical System	5,100 sf			/sf				30.01	153,031					153,031	232,257	
				26.01 Above Ground Electrical	1 ls							153,030.55	153,031					153,031	232,257	
			26.02	Instrumentation & Controls																
				Controls & Instrumentation	1 ls			/ls				264,180.00	264,180					264,180	400,950	
				26.02 Instrumentation & Controls	1 ls							264,180.00	264,180					264,180	400,950	
				26 Electrical & Instrumentation	1 ls							498,826.84	498,827					498,827	757,077	
		40		Process Piping																
			40.00	Under Ground Process Piping																
				Trench Excav & Lay Pipe 0- 4'	20 lf	600.000 lf / cd	2	2,539.31 /cd	85						1.88			122	194	
				Stone Pipe Bedding	3 cy	200.000 cy / cd	1	2,896.43 /cd	43	23.29	70							113	175	
				DI Pipe Push - Class 52 30	15 lf	0.440 mh / lf	7	51.34 /mh	339	167.28	2,509							2,848	4,344	
				DI Pipe Push - Class 52 36	5 lf	0.500 mh / lf	3	51.34 /mh	128	225.44	1,127							1,256	1,914	
				Hydrostatic Testing	20 lf	0.021 ch / lf	2	182.49 /ch	77	0.16	3							80	126	
				40.00 Under Ground Process Piping	20 lf		14		672	185.47	3,709			1.88	38			4,419	6,753	
			40.01	Above Ground Process Piping																
				Pipe Supports	4 ea	4.001 mh / ea	16	45.62 /mh	730	250.05	1,000							1,730	2,674	
				Hydrostatic Testing	142 lf	0.021 ch / lf	12	182.49 /ch	544	0.16	23							567	896	
				Dresser Couplings 6"	8 ea	2.400 ch / ea	19			170.00	1,360							1,360	2,064	
				Restrained Joint Couplings 10"	4 ea	5.721 ch / ea	92	182.49 /ch	4,176	283.06	1,132							5,308	8,328	
				Restrained Joint Couplings 24"	8 ea	13.803 ch / ea	442	182.49 /ch	20,151	684.14	5,473							25,624	40,200	
				14" DI Slab Thimble 12" long	2 ea	1.501 ch / ea	12	182.49 /ch	548	325.07	650			361.32				1,920	3,004	
				36" DI Wall Thimble 24" long	1 ea	2.500 ch / ea	10	182.49 /ch	456	1,286.26	1,286			602.00				2,344	3,632	
				36" DI Slab Thimble 12" long	4 ea	2.501 ch / ea	40	182.49 /ch	1,825	700.14	2,801			602.12				7,034	10,972	
				Gasket/Nuts/Bolt Kit 6"	22 ea	1.000 mh / ea	22	45.62 /mh	1,004	15.87	349							1,353	2,118	
				Gasket/Nuts/Bolt Kit 10"	5 ea	1.000 mh / ea	5	45.62 /mh	228	37.54	188							416	646	
				Gasket/Nuts/Bolt Kit 30"	3 ea	2.501 mh / ea	8	45.62 /mh	342	175.03	525							867	1,339	
				DI Flanged Joint Pipe 6"	70 lf	0.900 mh / lf	63	45.62 /mh	2,874	47.39	3,317							6,191	9,583	
				DI Flanged Joint Pipe 10"	46 lf	1.240 mh / lf	57	45.62 /mh	2,603	88.26	4,060							6,663	10,281	
				DI Flanged Joint Pipe 30"	26 lf	3.051 mh / lf	79	45.62 /mh	3,619	310.21	8,065							11,684	17,968	
				DI Flanged 90 ell 6"	5 ea	4.830 mh / ea	24	45.62 /mh	1,102	105.30	527							1,628	2,543	
				DI Flanged 90 ell 10"	1 ea	6.361 mh / ea	6	45.62 /mh	290	267.35	267							558	865	
				DI Flanged 90 ell 30"	2 ea	17.874 mh / ea	36	45.62 /mh	1,631	2,317.07	4,634							6,265	9,614	
				DI Flanged 90 ell 36"	0 ea	20.520 mh / ea	0	45.62 /mh	9	2,989.00	30							39	60	
				DI Flanged Tee 6"	4 ea	4.830 mh / ea	19	45.62 /mh	881	120.00	480							1,361	2,124	
				DI Flanged Tee 10"	2 ea	6.362 mh / ea	13	45.62 /mh	580	350.00	700							1,280	1,981	
				DI Flanged Tee 30"	4 ea	17.874 mh / ea	71	45.62 /mh	3,262	2,600.00	10,400							13,662	20,947	
				DI Blind Flange 10"	1 ea	6.101 mh / ea	6	45.62 /mh	278	247.85	248							526	817	
				DI Blind Flange 30"	1 ea	17.163 mh / ea	17	45.62 /mh	783	2,395.88	2,396							3,179	4,876	
				Chemical Piping & Accessories- ALLOWANCE	500 LF	0.240 mh / LF	120	45.62 /mh	5,476	55.01	27,505							32,981	50,412	
				40.01 Above Ground Process Piping	142 lf		1,190		53,393	545.19	77,417			26.29	3,733			134,542	207,943	
			40.02	Valves, Meters, Etc.																
				Backflow Preventer Flg 6"	2 ea	12.170 mh / ea	24	45.62 /mh	1,110	5,000.00	10,000							11,110	16,935	
				Magnetic Flow Meter - In-line - 24" w/ transmitter	1 ea	26.005 mh / ea	26	48.85 /mh	1,270	12,002.39	12,002							13,273	20,227	
				Swing Check Valve 6"	4 ea	4.669 mh / ea	19	45.62 /mh	852	1,100.00	4,400							5,252	8,026	
				Swing Check Valve 10"	2 ea	7.996 mh / ea	16	45.62 /mh	730	4,650.93	9,302							10,031	15,272	
				Swing Check Valve 24"	4 ea	18.001 mh / ea	72	45.62 /mh	3,285	14,402.88	57,612							60,896	92,637	
				10" Butterfly Valve, 125 lb class, CI Body, Flg. w/ EIM elec actuator NEMA 4	2 ea	9.602 mh / ea	19	45.62 /mh	876	5,701.14	11,402							12,278	18,692	
				24" Butterfly Valve, 125 lb class, CI Body, Flg. w/ EIM elec actuator NEMA 4	4 ea	19.204 mh / ea	77	45.62 /mh	3,504	12,502.50	50,010							53,514	81,448	
				40.02 Valves, Meters, Etc.	1 ls		253		11,628	154,728.01	154,728							166,356	253,237	
			40.04	Hydropneumatic Piping System																
				Hydropneumatic Piping, Fitting & Valve Allowance	1 ls	mh / ls		45.62 /mh				12,000.00						12,000	18,213	
				40.04 Hydropneumatic Piping System	1 ls							12,000.00						12,000	18,213	
				40 Process Piping	162 lf		1,456		65,692	1,455.89	235,854	74.07	12,000	23.28	3,771			317,317	486,145	
		43		Process Equipment																
			43.00	Pumps																
				Recycle Pumps - Vertical Turbine Pumps 75 hp, 8 mgd	3 ea	35.007 mh / ea	105	47.77 /mh	5,017	100.02	300					54,010.78	162,032	167,350	254,315	
				Water Transmission Pumps - Vert Turbine Pumps, 200 hp, 5.3 gpm, 208TDH	4 ea	117.023 mh / ea	468	47.77 /mh	22,363	100.02	400					108,021.56	432,086	454,849	691,785	
				Dewatering Pumps - Submersible Pumps 30 hp, 350 gpm, 208TDH	2 ea	24.005 mh / ea	48	42.59 /mh	2,045	100.02	200					29,005.79	58,012	60,256	91,585	
				43.00 Pumps	1 ls		621		29,425	900.18	900					652,130.16	652,130	682,455	1,037,685	
			43.16	Swift Water Chemical Injection In-Line Blender																
				Chemical Injection In-Line Blender	1 ea	25.005 mh / ea	25	42.40 /mh	1,060	1,500.30	1,500					50,009.98	50,010	52,570	79,856	
				43.16 Swift Water Chemical Injection In-Line Blender	1 ls		25		1,060	1,500.30	1,500				50,009.98	50,010	52,570	79,856		
			43.21	Air Compressor																
				Package Air Compressor 350 cfm	1 ea	40.000 mh / ea	40	42.40 /mh	1,696							35,000.00	35,000	36,696	55,804	
				43.21 Air Compressor	1 ls		40		1,696						35,000.00	35,000	36,696	55,804		
				43 Process Equipment	1 ls		686		32,181	2,400.48	2,400				737,140.14	737,140	771,721	1,173,345		
				6B High Service Pump Station (New)	1 ls		12,748		526,911	751,521.75	751,522	903,704.70	903,705	76,465.00	76,465	737,140.14	737,140	2,995,742	4,586,577	
				06 High Service Pump Station	1 ls		14,068		589,327	764,021.75	764,022	914,704.70	914,705	76,465.00	76,465	3,549,640.14	3,549,640	5,894,159	8,989,606	

WBS Lvl 1	WBS Lvl 2	WBS Lvl 3	WBS Lvl 4	Description	Takeoff Quantity	Labor Productivity	Man Hours	Labor Price	Labor Amount	Material Cost/Unit	Material Amount	Subcontract Cost/Unit	Subcontract Amount	Const Equip Cost/Unit	Const Equip Amount	Process Equip Cost/Unit	Process Equip Amount	Total Amount	Grand Total Amount
07				Groundwater & Surface Water															
	7A			Groundwater & Surface Water 50/50 Blend															
		70		Groundwater & Surface Water 50/50 Blend															
			70.00	Groundwater & Surface Water 50/50 Blend															
				Estimate Place Holder	1	1s		/s											
				70.00 Groundwater & Surface Water 50/50 Blend	1	1s													
				70 Groundwater & Surface Water 50/50 Blend	1	1s													
				7A Groundwater & Surface Water 50/50 Blend	1	1s													
				07 Groundwater & Surface Water	1	1s													

WBS Lvl 1	WBS Lvl 2	WBS Lvl 3	WBS Lvl 4	Description	Takeoff Quantity	Labor Productivity	Man Hours	Labor Price	Labor Amount	Material Cost/Unit	Material Amount	Subcontract Cost/Unit	Subcontract Amount	Const Equip Cost/Unit	Const Equip Amount	Process Equip Cost/Unit	Process Equip Amount	Total Amount	Grand Total Amount
08				Electrical and E&I															
	8A			Electrical- Rehab															
		26		Electrical & Instrumentation															
			26.01	Above Ground Electrical															
				Estimate Place Holder	1	1/s		/s											
				26 Electrical & Instrumentation	1	1/s													
				8A Electrical- Rehab	1	1/s													
	8B			E&I - Rehab															
		26		Electrical & Instrumentation															
			26.02	Instrumentation & Controls															
				Estimate Place Holder	1	1/s		/s											
				26.02 Instrumentation & Controls	1	1/s													
				26 Electrical & Instrumentation	1	1/s													
				8B E&I - Rehab	1	1/s													
				08 Electrical and E&I	1	1/s													

WBS Lvl 1	WBS Lvl 2	WBS Lvl 3	WBS Lvl 4	Description	Takeoff Quantity	Labor Productivity	Man Hours	Labor Price	Labor Amount	Material Cost/Unit	Material Amount	Subcontract Cost/Unit	Subcontract Amount	Const Equip Cost/Unit	Const Equip Amount	Process Equip Cost/Unit	Process Equip Amount	Total Amount	Grand Total Amount
09				Outfall & Floodwater System															
	9A			Outfall & Floodwater System- Rehab															
		90		Outfall & Floodwater System- Rehab															
			90.00	Outfall & Floodwater System- Rehab															
				Outfall & Floodwater System- Rehab	1	ls		/ls				100,000.00	100,000					100,000	151,772
				90.00 Outfall & Floodwater System- Rehab	1	ls						100,000.00	100,000					100,000	151,772
				90 Outfall & Floodwater System- Rehab	1	ls						100,000.00	100,000					100,000	151,772
				9A Outfall & Floodwater System- Rehab	1	ls						100,000.00	100,000					100,000	151,772
				09 Outfall & Floodwater System	1	ls						100,000.00	100,000					100,000	151,772

WBS Lvl 1	WBS Lvl 2	WBS Lvl 3	WBS Lvl 4	Description	Takeoff Quantity	Labor Productivity	Man Hours	Labor Price	Labor Amount	Material Cost/Unit	Material Amount	Subcontract Cost/Unit	Subcontract Amount	Const Equip Cost/Unit	Const Equip Amount	Process Equip Cost/Unit	Process Equip Amount	Total Amount	Grand Total Amount
10				Laboratory															
	10A			Laboratory- Rehab															
		10		Laboratory- Rehab															
			10.04	Laboratory- Rehab															
				Laboratory Equipment Upgrade Allowance	1	ls		/ls				50,000.00	50,000					50,000	75,886
				10.04 Laboratory- Rehab	1	ls						50,000.00	50,000					50,000	75,886
				10 Laboratory- Rehab	1	ls						50,000.00	50,000					50,000	75,886
				10A Laboratory- Rehab	1	ls						50,000.00	50,000					50,000	75,886
				10 Laboratory	1	ls						50,000.00	50,000					50,000	75,886

Estimate Totals

Description	Amount	Totals	Hours	Rate	Cost Basis	Cost per Unit	Percent of Total
Labor	28,222,766		707,472 hrs				10.36%
Overtime - 50 hr wk (w/ 1.5)					C		
Material	33,259,065						12.20%
Subcontract	27,440,416						10.07%
Equipment	8,801,548		94,226 hrs				3.23%
Process Equip	80,218,708						29.43%
Subtotal	177,942,503	177,942,503					65.29%
Sales Tax (Const Equipment)	649,554			7.38 %	C		0.24%
Mobilization/Demobilization	1,779,425			1.00 %	T		0.65%
Safety Supplies and Equip (L)	846,683			3.00 %	C		0.31%
Small Tools and Equip (L)	564,455			2.00 %	C		0.21%
Consumables (L)	423,341			1.50 %	C		0.16%
Testing & Commissioning	1,779,425			1.00 %	T		0.65%
3rd Party Inspections	889,713			0.50 %	C		0.33%
Tax & Misc Subtotal	6,932,596	184,875,099					2.54%
General Conditions	17,794,250			10.00 %	C		6.53%
General Conditions Subtotal	17,794,250	202,669,349					6.53%
Contingency (%)	30,400,403			15.00 %	T		11.15%
Contingency Subtotal	30,400,403	233,069,752					11.15%
Escalation- (mid pt 2023 @ 2.68%/yr)	15,965,278			6.85 %	T		5.86%
Escalation Subtotal	15,965,278	249,035,030					5.86%
Market Conditions- Max					T		
Msarket Conditions		249,035,030					91.37%
Permits	1,362,751			0.50 %	T		0.50%
All Risk Insurance	1,867,763			0.75 %	T		0.69%
Performance & Payment Bond	2,490,350			1.00 %	T		0.91%
Permits, Ins, & Bonds Subtotal	5,720,864	254,755,894					2.10%
G.C Overhead and Profit	17,794,250			10.00 %	C		6.53%
GC OH&P Subtotal	17,794,250	272,550,144					6.53%
Total		272,550,144					100.00%

OUCG DR 17-7

DATA REQUEST
City of Evansville

Cause No. 45545

Information Requested:

Please state the dates of the cost estimates in the Advanced Facility Plan were prepared and the year assumed for the costs (e.g., 2021 dollars, 2022 dollars, etc.). Please also state the level of design on which the cost estimates are based (e.g., 30% design completion).

Information Provided:

The costs were developed between in the third and fourth quarters of 2020. Estimates were based on 2020 dollars and escalated by 3%. However, it is now understood escalation has increased considerably going into 2021. The cost estimates were based on the alternative evaluations report, which is conceptual level (approximately 10% design).

OUCG DR 17-8

DATA REQUEST
City of Evansville

Cause No. 45545

Information Requested:

For Evansville's preferred new water treatment plant Alternate 2B, please identify the engineering costs (planning, design, bidding assistance, construction engineering, and inspection services) anticipated for the project and state the costs for each engineering component incurred to date.

Information Provided:

The following amounts have been spent or planned to be spent as follows:

Planning	\$870,173	See invoices provided in response to OUCG DR 17-12	Status: complete
Preliminary Design	\$620,159	See invoices provided in response to OUCG DR 17-12	Status: Current, \$1,015,668 remaining contracted for task
Final Design	\$7,756,696	Budgeted	Status: Not started, funds reserved and ready
Construction	\$140,049,000	Planned	See Table 11-3 of submitted PER
Bidding/Con. Admin/Inspection	\$6,302,000	Planned	See Table 11-3 of submitted PER

OUCG DR 17-10

DATA REQUEST
City of Evansville

Cause No. 45545

Information Requested:

For Evansville's water treatment plant rehabilitation Alternate 1, please provide cost support documentation for each major component lump sum cost listed in Table 9-2 Plant Alternative 1 Total Estimated Construction Cost on pages 117 and 118 of the Advanced Facility Plan (Attachment SMB-1 to Mr. Breese's case-in-chief testimony in this cause). Please provide copies of the Excel worksheets detailing quantities, unit costs, equipment costs, other data used to establish costs, and all assumptions and cost allowances. Please also provide copies of budgetary cost proposals provided by equipment vendors and material suppliers.

Information Provided:

The spreadsheet is attached as OUCG DR 17-10 - Alt 1.xls. See also OUCG DR 17-6 - Timberline Output.pdf (developed in Timberline Cost estimating software) which presents further detail for cost estimates performed early in the development of the alternatives report. See response to OUCG DR 17-6 for quotes.

Attachment:

OUCG DR 17-10.xls.

Cause No. 45545
OUCG DR 17-10 Attachment 1

Evansville Water and Sewer Utility

WTP Upgrade - Plant Alternative 1 - Capital Cost

Component Description	Cost	
Civil Site Work (Roads, Drainage, Fencing etc.)	\$3,500,000	
Rehabilitate River Intake	\$6,752,000	
North Plant Pretreatment Improvements	\$13,610,000	
North Plant Ozone System Retrofit	\$16,935,000	
Rehabilitate Gravity Filters	\$17,125,000	
New Sodium Hypochlorite System	\$2,092,000	
PAC Feed Improvements	\$1,000,000	
Other Chemical Improvements (4 at \$300k ea.)	\$1,200,000	4 chemical Systems
Demolish South Plant	\$1,066,000	
Construct New 6 MG Clearwell	\$10,960,000	
Rehabilitate Existing 6.5 MG Clearwell	\$734,000	
Rehabilitate High Service Pump Stations #2, #3	\$8,733,000	
Extend 3 Plant Outfalls (\$750k ea.)	\$2,250,000	3 Outfalls
Building Renovations	\$4,000,000	
Interconnecting Site Utility / Electrical Work	\$3,500,000	
Other Demolition Work Throughout Plant	\$2,000,000	
Subtotal	\$95,457,000	
Additional Construction Contingencies (15%)	\$14,319,000	
Other Misc. Plant-Wide Improvements (5%)	\$4,773,000	
Phasing & Sequencing Plant Outages (5%)	\$4,773,000	
Remediation & Hazardous Martials	\$1,000,000	
Allowances	\$500,000	
Startup and Commissioning	\$1,000,000	
Total Estimated Construction Cost	\$121,822,000	



Original Costs from Estimator

Description	Estimated Base Cost (from estimate)	Estimated Loaded Cost (from estimate)	Multiplier from Estimate
Demolition Work	\$49,600	\$75,000	1.512
Roof Repair / Replacement	\$7,000	\$10,500	1.500
Doors & Hardware Rehab	\$13,000	\$19,700	1.515
Building Finishes & Specialties	\$34,200	\$50,500	1.477
Structure and Walkway Rehabilitation	\$50,000	\$75,500	1.510
Process Piping and Accessories	\$209,000	\$317,800	1.521
Pump Replacement	\$1,335,500	\$2,020,400	1.513
Screen Replacement	\$666,000	\$1,019,100	1.530
Potassium Permanganate System	\$249,000	\$366,000	1.470
HVAC Replacement	\$115,000	\$172,000	1.496
Electrical Systems	\$200,000	\$302,000	1.510
Instrumentation	\$84,000	\$126,900	1.511
Totals	\$3,012,300	\$4,555,400	

Adjusted for Report

Table B1.1 - River Intake Rehabilitation, Low Service PS

Description		Estimated Cost
Demolition Work		\$75,000
Roof Repair / Replacement (3,000 sf)		\$60,000
Doors & Hardware Rehab		\$13,000
Building Finishes & Specialties		\$35,000
Structure and Walkway Rehabilitation		\$50,000
Process Piping and Accessories		\$209,000
Pump Replacement (6 units)		\$1,336,000
Intake Screens (3 units)		\$1,300,000
Potassium Permanganate System (1 unit)		\$400,000
HVAC Replacement (3,000 sf)		\$115,000
Misc. Electrical (MCC Upgrades are Underway)		\$150,000
Instrumentation		\$100,000
Subtotal		\$3,843,000
Estimating Contingency	30%	\$1,152,900
Escalation to Midpoint	3%	\$115,290
Construction Subtotal		\$5,111,190
Contractor General Conditions	10%	\$511,119
Contractor Overhead and Profit	12%	\$613,343
Construction Contingencies	5%	\$255,560
Allowance: Dredge River		\$260,000
Grand Total Cost		\$6,752,000

Cost Adjust Comments

X - City noted a whole new roof

X - quote of \$750k for 3 screens - estimate seems to be pneumatic screens? Access from existing bridge, barge not needed

X - estimate seemed low - need to run piping over, hopper, storage, etc.

X - MCC's are getting some upgrades

Effective Multiplier 1.76

Original Costs from Estimator

Description		Estimated Base Cost (from estimate)	Estimated Loaded Cost (from estimate)	Multiplier from Estimate
02.01 Demolition Work	Demolition Work	\$76,883	\$119,797	1.558
	Modify Existing Structure & Service	\$1,906,341	\$2,944,607	1.545
43.03 Baffle Walls	Baffle Walls	\$346,653	\$530,906	1.532
40.01 Above Ground Process Piping	Process Piping	\$18,825	\$28,586	1.519
43.01 Flocculators & Mixers	Flocculators & Mixers	\$921,261	\$1,402,364	1.522
43.02 Settlement Equipment	Settlement Equipment	\$3,398,594	\$5,171,988	1.522
43.20 Slide Gate w/ Operator	Slide Gate w/ Operator	\$131,601	\$199,566	1.516
26.01 Above Ground Electrical	Electrical	\$315,783	\$477,528	1.512
26.02 Instrumentation & Controls	Instrumentation & Controls	\$94,735	\$143,258	1.512
Grand Total Capital Construction Cost	Grand Total Capital Construction Cost	\$7,210,676	\$11,018,600	

Adjusted for Report

Table B2.1 - Retrofit North Pretreat w/Plate Settlers

Description		Estimated Cost
Demolition Work		\$90,000
Modify Existing Structure & Services		\$2,307,000
Flow Control Diffuser Wall SS 304 (360 lf)		\$347,000
Process Piping and Valves		\$150,000
Coagulant Injection Improvements		\$75,000
Flocculators & Mixers w/VFD (24 units)		\$922,000
Plate Settlers & Sludge Collection		\$3,399,000
Slide Gate w/ Operator (6 units)		\$180,000
Electrical (8% Equip Cost)		\$361,000
Instrumentation & Controls (5% Equip Cost)		\$226,000
Subtotal		\$8,057,000
Estimating Contingency	30%	\$2,417,100
Escalation to Midpoint	3%	\$241,710
Construction Subtotal		\$10,715,810
Contractor General Conditions	10%	\$1,071,581
Contractor Overhead and Profit	12%	\$1,285,897
Construction Contingencies	10%	\$535,791
Grand Total Cost		\$13,610,000

Cost Adjust
Comments

X - EWSU wants influent channels and effluent launders completely rehabed - added \$400k to cost

X - Seemed low, updated to 150K

X - 30K to match 120K for 4 units in new option

X - Use 8% of equipment cost

X - Use 5% of equipment cost

Original Costs from Estimator

Description		Estimated Base		
		Cost (from estimate)	Estimated Loaded Cost (from estimate)	Multiplier from Estimate
Rehab North Basins # 1 - 5				
02.01 Demolition Work	Demolition Work	\$308,326	\$478,430	1.552
	Building Structure	\$896,554	\$1,389,903	1.550
31.12 Structure Backfill	Foundation and Earthwork	\$542,559	\$838,263	1.545
40.01 Above Ground Process Piping	Process Piping	\$16,825	\$25,562	1.519
Ozone Facility				
	Buidling Structure	\$364,087	\$558,710	1.535
	Process Piping	\$298,560	\$459,056	1.538
40.02 Valves, Meters, Etc.	Valves, Meters, Etc.	\$12,895	\$19,597	1.520
43.10 Ozone Equipment	Ozone Equipment	\$3,497,647	\$5,302,139	1.516
22.00 Plumbing	Plumbing	\$34,447	\$52,091	1.512
23.00 HVAC	HVAC	\$258,300	\$390,602	1.512
	Electrical	\$208,973	\$316,009	1.512
26.02 Instrumentation & Controls	Instrumentation & Controls	\$49,500	\$74,854	1.512
LOX Equipment				
	Buidling Structure	\$23,462	\$36,190	1.542
32.01 Fencing & Gates	Fencing & Gates	\$5,142	\$7,776	1.512
	Process Piping	\$28,183	\$43,688	1.550
40.02 Valves, Meters, Etc.	Valves, Meters, Etc.	\$20,611	\$31,273	1.517
43.17 LOX Equipment	LOX Vaporizor, Tank, Station	\$890,881	\$1,347,884	1.513
26.01 Above Ground Electrical	Electrical	\$42,977	\$64,990	1.512
26.02 Instrumentation & Controls	Instrumentation & Controls	\$12,893	\$19,497	1.512
Grand Total Capital Construction Cost	Grand Total Capital Construction (\$7,512,822	\$11,456,514	

Adjusted for Report

Table B3.3 - Ozonation in Existing Basins

Description		Estimated Cost	Cost Adjust Comments
Rehab North Secondary Basins			
Demolition Work		\$309,000	
Basin Modifications		\$897,000	
Ozone Corrosion Additives		\$100,000	X - 10% of basin modifications, added
Basin Abandon, Structural Backfill		\$543,000	
Process Piping		\$100,000	X - seemed low
Access Hatches (8 units)		\$120,000	X - Added item
Ozone Facility			
Building Structure (5,712 sf)		\$365,000	
Process Piping		\$299,000	
Sampling System (pumps, piping, Analyzers)		\$100,000	X - Added this item
Valves, Meters, etc.		\$155,000	X - assume 35 valves (9 pumps)+15K for small valves
Ozone System, quench, destruct (2 units)		\$4,498,000	X - Add 30% (1 Mill) for install
Plumbing (5,740 sf)		\$75,000	
HVAC (5,740 sf)		\$259,000	
Electrical		\$900,000	X - 150K for Bldg and 750K for Ozone
Instrumentation & Controls (5 % Equip Cost)		\$225,000	X - Ozone I&C would be higher; use higher
LOX Equipment			
Equipment Pad (1,462 sf)		\$35,000	X - Make 35K based on 12" slab and \$600/cy
Misc. Site and Access Improvements		\$25,000	
Process Piping		\$29,000	
Valves, Meters, etc.		\$42,000	X - Double estimator number
LOX Vaporizer, Tank, Station (2 units)		\$891,000	
Electrical (5% Equip Cost)		\$45,000	
Instrumentation & Controls (1.5% Equip Cost)		\$14,000	
Subtotal			
		\$10,026,000	
Estimating Contingency		30%	\$3,007,800
Escalation to Midpoint		3%	\$300,780
Construction Subtotal			\$13,334,580
Contractor General Conditions		10%	\$1,333,458
Contractor Overhead and Profit		12%	\$1,600,150
Construction Contingencies		5%	\$666,729
Grand Total Cost			\$16,935,000

Table B3.3a - Ozonation in Existing Basins and Filter Rehabilitation

Description		Estimated Cost
Rehab North Secondary Basins		
Demolition Work		\$309,000
Basin Modifications		\$897,000
Ozone Corrosion Additives		\$100,000
Basin Abandon, Structural Backfill		\$543,000
Process Piping		\$100,000
Access Hatches (8 units)		\$120,000
Ozone Facility		
Building Structure (5,712 sf)		\$365,000
Process Piping		\$299,000
Sampling System (pumps, piping, Analyzers)		\$100,000
Valves, Meters, etc.		\$155,000
Ozone System, quench, destruct (2 units)		\$4,498,000
Plumbing (5,740 sf)		\$75,000
HVAC (5,740 sf)		\$259,000
Electrical		\$900,000
Instrumentation & Controls (5 % Equip Cost)		\$225,000
LOX Equipment		
Equipment Pad (1,462 sf)		\$35,000
Misc. Site and Access Improvements		\$25,000
Process Piping		\$29,000
Valves, Meters, etc.		\$42,000
LOX Vaporizer, Tank, Station (2 units)		\$891,000
Electrical (5% Equip Cost)		\$45,000
Instrumentation & Controls (1.5% Equip Cost)		\$14,000
Filter Rehabilitation Base Cost		\$10,138,000
Subtotal		\$20,164,000
Estimating Contingency	30%	\$6,049,200
Escalation to Midpoint	3%	\$604,920
Construction Subtotal		\$26,818,120
Contractor General Conditions	10%	\$2,681,812
Contractor Overhead and Profit	12%	\$3,218,174
Construction Contingencies	5%	\$1,340,906
Grand Total Cost		\$34,060,000

Original Costs from Estimator

Description		Estimated Base Cost (from estimate)	Estimated Loaded Cost (from estimate)	Multiplier from Estimate
Rehab Filters 21 - 28				
02.01 Demolition Work	Demolition Work	\$231,041	\$363,200	1.572
03.30 Patch Cracks and Resurface Concrete	Patch Cracks and Resurface Concrete	\$80,975	\$127,647	1.576
09.00 Finishes	Paint Finishes	\$162,284	\$254,077	1.566
43.05 Filtration Equipment	Filtration Equipment	\$899,723	\$1,384,578	1.539
Rehab Filters 29 - 32				
02.01 Demolition Work	Demolition Work	\$235,083	\$369,574	1.572
03.30 Patch Cracks and Resurface Concrete	Patch Cracks and Resurface Concrete	\$80,975	\$127,647	1.576
09.00 Finishes	Paint Finishes	\$216,896	\$340,293	1.569
40.01 Above Ground Process Piping	Process Piping	\$137,561	\$211,658	1.539
43.05 Filtration Equipment	Filtration Equipment	\$914,273	\$1,406,800	1.539
Filter Building 21 - 36				
02.01 Demolition Work	Demolition Work	\$264,000	\$399,221	1.512
08.00 Doors, Frames & Hardware	Doors, Frames & Hardware	\$520,062	\$786,684	1.513
09.00 Finishes	Paint Finishes	\$143,284	\$220,121	1.536
23.00 HVAC	HVAC	\$880,000	\$1,330,738	1.512
26.01 Above Ground Electrical	Electrical	\$792,000	\$1,197,664	1.512
Grand Total Capital Construction Cost	Grand Total Capital Construction Cost	\$5,558,157	\$8,519,902	

Adjusted for Report

Table B3.1 - Existing Filter Rehabilitation

Description		Estimated Cost	Cost Adjust Comments
Rehab Filters 21 - 28			Filters are 28 X 37
Demolition Work		\$232,000	
Patch Cracks and Resurface Concrete		\$81,000	
Paint Finishes		\$163,000	
Filtration Equipment and Media		\$1,700,000	Too low in original
SS Air Scour Grids		\$720,000	X - Assume 90K per filter;
Air Scour Blowers (2 units)		\$425,000	X - Use half the cost from MGF alt blower pricing
Rehab Filters 29 - 36			Filters are 23 X 46
Demolition Work		\$236,000	
Patch Cracks and Resurface Concrete		\$150,000	
Paint Finishes		\$217,000	
Process Piping Improvements		\$138,000	
Filtration Equipment and Media		\$1,400,000	
Aluminum Storefronts		\$521,000	
SS Air Scour Grids		\$720,000	X - Assume 90K per filter
Air Scour Blowers (2 units)		\$425,000	X - Use half the cost from MGF alt blower pricing
Filter Building Improvements			
Filters 1-20 Demolition Work		\$264,000	
Misc. Doors, Frames & Storefronts		\$30,000	X - Filters 21-28 already have the storefront window (Delete writeup/estimate)
Paint Finishes		\$144,000	
HVAC Improvements		\$880,000	
Electrical Improvements		\$792,000	
Instrumentation and Controls Improvements		\$500,000	
Subtotal		\$10,138,000	
Estimating Contingency	30%	\$3,041,400	
Escalation to Midpoint	3%	\$304,140	
Construction Subtotal		\$13,483,540	
Contractor General Conditions	10%	\$1,348,354	
Contractor Overhead and Profit	12%	\$1,618,025	
Construction Contingencies	5%	\$674,177	
Allowances:			
Grand Total Cost		\$17,125,000	



Summary Table

Description		Estimated Cost
Demolition & Media Removal		\$732,000
Filters 21-28 Concrete Repair		\$81,000
Filters 29-32 Concrete Repair		\$450,000
Pipe Resurfacing & Paint Finishes		\$524,000
Pipe Replacement		\$238,000
Filtration Equipment, Media & Valves		\$3,100,000
Storefront Walls (Filters 29-32) & Arch. Improvements		\$551,000
Air Scour Grids		\$1,440,000
Air Scour Blowers (4 ea.)		\$850,000
HVAC Improvements		\$880,000
Electrical & I&C Improvements		\$1,292,000
Subtotal		\$10,138,000
Estimating Contingency	30%	\$3,041,400
Escalation to Midpoint	3%	\$304,140
Construction Subtotal		\$13,483,540
Contractor General Conditions	10%	\$1,348,354
Contractor Overhead and Profit	12%	\$1,618,025
Construction Contingencies	5%	\$674,177
Grand Total Cost		\$17,125,000

Original Costs from Estimator

Description		Estimated Base Cost (from estimate)	Estimated Loaded Cost (from estimate)	Multiplier from Estimate
	Building Structure	\$381,041	\$580,876	1.524
40.01	Above Ground Process Piping	\$26,385	\$40,184	1.523
43.00	Pumps	\$299,011	\$453,245	1.516
43.13	Chemical System Equipment	\$78,332	\$119,317	1.523
21.00	Fire Protection (Wet System)	\$21,724	\$32,852	1.512
22.00	Plumbing	\$20,009	\$30,258	1.512
23.00	HVAC	\$81,855	\$123,781	1.512
	Electrical	\$169,292	\$256,114	1.513
26.02	Instrumentation & Controls	\$94,224	\$142,486	1.512
Grand Total Capital Construction		\$1,171,873	\$1,779,113	

Adjusted for Report

Table B4.2 - Liquid Hypochlorite Disinfection (Bulk)

Description		Estimated Cost	Cost Adjust Comments
Building Structure (1,819 sf)		\$382,000	
Process Piping		\$53,000	Very low in original
Pumps (carrier, transfer, metering)		\$300,000	
Liquid Chemical Feed Equipment		\$179,000	X - day tanks included, but no bulk tanks
Fire Protection (Wet System, 1,819 sf)		\$29,000	X - updated for square footage
Plumbing (1,819 sf)		\$21,000	
HVAC (1,819 sf)		\$110,000	X - Use \$60/sf instead of \$45/sf used elsewhere
Electrical (1,819 sf)		\$170,000	
Instrumentation & Controls		\$95,000	
Subtotal		\$1,339,000	
Estimating Contingency	20%	\$267,800	
Escalation to Midpoint	3%	\$40,170	
Construction Subtotal		\$1,646,970	
Contractor General Conditions	10%	\$164,697	
Contractor Overhead and Profit	12%	\$197,636	
Construction Contingencies	5%	\$82,349	
Grand Total Cost		\$2,092,000	

PAC System Upgrade

	Unit	Quantity	Unit Cost	Total Cost
Concrete Repair	LS	1	\$50,000	\$50,000
Accessories Replacement	LS	1	\$80,000	\$80,000
Mixers	EA	2	\$15,000	\$30,000
Slurry Pumps	EA	4	\$10,000	\$40,000
Metering Pumps	EA	8	\$7,500	\$60,000
HVAC Upgrades	LS	1	\$80,000	\$80,000
Piping & Valve Replacement	LS	1	\$100,000	\$100,000
Electrical and Controls	LS	1	\$200,000	\$200,000
Subtotal				\$640,000
Estimating Contingency	20%			\$128,000
Escalation to Midpoint	3%			\$19,200
Construction Subtotal				\$787,200
Contractor General Conditions	10%			\$78,720
Contractor Overhead and Profit	12%			\$94,464
Construction Contingencies	5%			\$39,360
Total				\$1,000,000

Other Chemical Systems

	Unit	Quantity	Unit Cost	Total Cost
Misc. Elec / Control Upgrades	LS	1	\$80,000	\$80,000
Misc. Valve / Piping Replacement	LF	500	\$65	\$32,500
Pump Replacement	EA	2	\$7,500	\$15,000
Room Hardware / Finishes	LS	1	\$40,000	\$40,000
HVAC Improvements	LS	1	\$25,000	\$25,000
Subtotal				\$192,500
Estimating Contingency	20%			\$38,500
Escalation to Midpoint	3%			\$5,775
Construction Subtotal				\$236,775
Contractor General Conditions	10%			\$23,678
Contractor Overhead and Profit	12%			\$28,413
Construction Contingencies	5%			\$11,839
Total				\$300,000

Demolish South Plant

Description		Estimated Cost
Demo scrapers / drives, walks		\$50,000
Demo Concrete / haul (4800 CY at \$150/yd)		\$712,792
Site Restoration / Fill		\$50,000
Subtotal		\$812,792
Estimating Contingency	10%	\$81,279
Escalation to Midpoint	3%	\$24,384
Construction Subtotal		\$918,455
Contractor General Conditions	3%	\$27,554
Contractor Overhead and Profit	8%	\$73,476
Construction Contingencies	5%	\$45,923
Allowances:		
Grand Total Cost		\$1,066,000

130 ft diameter primary
90 ft diameter secondary
2 ft overall thickness
18 ft depth
1843.06769 CY for walls
2908.88209 CY for floors

Reduce due to fairly defined demo work

Reduced GC's and OHP due to mainly demo wor
Reduced OHP due to demo work

Original Costs from Estimator

Description		Estimated Base Cost (from estimate)	Estimated Loaded Cost (from estimate)	Multiplier from Estimate
31.01 Dewatering	Structural Components	\$3,507,453	\$5,415,382	1.544
	Dewatering	\$109,646	\$167,526	1.528
31.02 Piles	Piles	\$1,133,796	\$1,727,195	1.523
	Excavation	\$1,734,001	\$2,658,794	1.533
	Soil and Backfill	\$523,109	\$828,067	1.583
Grand Total Capital Construction C Grand Total Capital Construction Cost		\$7,008,005	\$10,796,964	

Adjusted for Report

Table B5.1b - Large Clearwell (6 MG) Option

Description		Estimated Cost
Structure (275'x137'x24')		\$3,333,000
Dewatering (2 pumps, 4 mo)		\$110,000
Piles (26,975 vf)		\$1,078,000
Excavation, Shoring		\$1,648,000
Soil and Backfill		\$497,000
60-inch Transfer Piping		\$200,000
Transfer Pipe Utility coordination / site restoration		\$150,000
Subtotal		\$7,016,000
Estimating Contingency	20%	\$1,403,200
Escalation to Midpoint	3%	\$210,480
Construction Subtotal		\$8,629,680
Contractor General Conditions	10%	\$862,968
Contractor Overhead and Profit	12%	\$1,035,562
Construction Contingencies	5%	\$431,484
Allowances:		
Grand Total Cost		\$10,960,000

Cost Adjust
Comments

adjusted quantities by 95% of the 6.5 MG clearwell to accommodate 4 MG (did not adjust dewatering)

60 inch piping to high service station 2
400 ft \$500 per ft

Description

31.01 Dewatering

31.02 Piles

Grand Total Capital Construction Cost

Description		Estimated Cost
Concrete Repair - Walls 1560 SY @ \$40/SY		\$62,507
Concrete Repair - Floor (1680 SY at \$30/SY)		\$50,473
New Concrete Wall (400 CY at \$750/CY)		\$301,333
Hatch Replacement (6 at \$5k ea)		\$30,000
Misc Improvements		\$25,000
Subtotal		\$469,313
Estimating Contingency	20%	\$93,863
Escalation to Midpoint	3%	\$14,079
Construction Subtotal		\$577,255
Contractor General Conditions	10%	\$57,726
Contractor Overhead and Profit	12%	\$69,271
Construction Contingencies	5%	\$28,863
Allowances:		
Grand Total Cost		\$734,000

	Existing	New Wall
	226 ft	2 ft wide
	67 ft	401.7777778 CY
	24 ft deep	
walls	1562.667 SY	
floors	1682.444	

Original Costs from Estimator

Description		Estimated Base Cost (from estimate)	Estimated Loaded Cost (from estimate)	Multiplier from Estimate
43.00 Pumps	Pumps	\$2,898,416	\$4,387,048	1.514
	Grand Total Capital Constructio	\$2,898,416	\$4,387,048	

Grand Total Capital Construction Cost

Renovate 2 and 3

Table B6.1 - High Service Pump Rehab Option (2 and 3)

Description		Estimated Cost
Remove Vertical Turbines (3 at \$10k ea)		\$30,000
Remove Split Case Pumps (2 at \$5k ea)		\$10,000
New Vertical Turbine Pumps (3 at \$900k ea)		\$2,700,000
New Split case pumps (2 at \$750 k ea)		\$1,500,000
Minor pump rehab work (2 at \$25k ea)		\$50,000
Piping and Valve Rehab		\$250,000
Electrical & I&C Work (15% Pump Equipment)		\$630,000
Subtotal		\$5,170,000
Estimating Contingency	30%	\$1,551,000
Escalation to Midpoint	3%	\$155,100
Construction Subtotal		\$6,876,100
Contractor General Conditions	10%	\$687,610
Contractor Overhead and Profit	12%	\$825,132
Construction Contingencies	5%	\$343,805
Grand Total Cost		\$8,733,000

Renovate 3 only

Description		Estimated Cost
Remove Vertical Turbines (3 at \$10k ea)		\$30,000
New Vertical Turbine Pumps (3 at \$900k ea)		\$2,700,000
Piping and Valve Rehab		\$250,000
Electrical & I&C Work (15% Pump Equipment)		\$405,000
Subtotal		\$3,385,000
Estimating Contingency	30%	\$1,015,500
Escalation to Midpoint	3%	\$101,550
Construction Subtotal		\$4,502,050
Contractor General Conditions	10%	\$450,205
Contractor Overhead and Profit	12%	\$540,246
Construction Contingencies	5%	\$225,103
Grand Total Cost		\$5,718,000



Civil Work

	Unit	Quantity	Unit Cost	Total Cost
Demo: Storm Structures	LS	1	\$150,000	\$150,000
Dmo: Pavement	LS	1	\$100,000	\$100,000
Debris Hauling / Misc Excavation	LS	1	\$200,000	\$200,000
Demo: Underground Structures	LS	1	\$300,000	\$300,000
New Fencing	LF	3180	\$65	\$206,700
Gate / Card Access	EA	2	\$30,000	\$60,000
New Storm Piping (smaller)	LF	2000	\$100	\$200,000
Large Storm Piping / Structures	LS	1	\$250,000	\$250,000
Stormwater Pump Station Upgrades	LS	1	\$300,000	\$300,000
Site Paving	SY	6100	\$40	\$244,000
Site Grading	LS	1	\$80,000	\$80,000
Additional Dewatering	LS	1	\$150,000	\$150,000
Subtotal				\$2,240,700
Estimating Contingency	20%			\$448,140
Escalation to Midpoint	3%			\$67,221
Construction Subtotal				\$2,756,061
Contractor General Conditions	10%			\$275,606
Contractor Overhead and Profit	12%			\$330,727
Construction Contingencies	5%			\$137,803
Total				\$3,500,000

Outfall Extension (each outfall)

	Unit	Quantity	Unit Cost	Total Cost
Levee excavation / army coord.	LS	1	\$300,000	\$300,000
Pipe Extension	LF	100	\$500	\$50,000
Backfill and restoration	LS	1	\$100,000	\$100,000
Misc. Anchoring	LS	1	\$30,000	\$30,000
Subtotal				\$480,000
Estimating Contingency	20%			\$96,000
Escalation to Midpoint	3%			\$14,400
Construction Subtotal				\$590,400
Contractor General Conditions	10%			\$59,040
Contractor Overhead and Profit	12%			\$70,848
Construction Contingencies	5%			\$29,520
Total				\$750,000

Building Renovations

	Unit	Quantity	Unit Cost	Total Cost
Levee excavation / army coord.	LS	1	\$300,000	\$300,000
Pipe Extension	LF	100	\$500	\$50,000
Backfill and restoration	LS	1	\$100,000	\$100,000
Misc. Anchoring	LS	1	\$30,000	\$30,000
Subtotal				\$480,000
Estimating Contingency	20%			\$96,000
Escalation to Midpoint	3%			\$14,400
Construction Subtotal				\$590,400
Contractor General Conditions	10%			\$59,040
Contractor Overhead and Profit	12%			\$70,848
Construction Contingencies	5%			\$29,520
Total				\$750,000

Building Renovations

Admin area, Filters 1-20, garage	SF	51200	\$50	\$2,560,000
Subtotal				\$2,560,000
Estimating Contingency	20%			\$512,000
Escalation to Midpoint	3%			\$76,800
Construction Subtotal				\$3,148,800
Contractor General Conditions	10%			\$314,880
Contractor Overhead and Profit	12%			\$377,856
Construction Contingencies	5%			\$157,440
Total				\$3,999,000
			Use	\$4,000,000

These Buildings are in the worst condition - renovation costs are included for filters 21-36, river ntake, pump stations, etc.

Elec and Utilities

New Electrical Ductbanks & Cabling	LF	1100	\$900	\$990,000
Buried Chemical Piping	LF	880	\$160	\$140,800
Elec Service Upgrades	LS	1	\$750,000	\$750,000
Larger Dia Interconnecting Pipe	LF	450	\$800	\$360,000
Subtotal				\$2,240,800
Estimating Contingency	20%			\$448,160
Escalation to Midpoint	3%			\$67,224
Construction Subtotal				\$2,756,184
Contractor General Conditions	10%			\$275,618
Contractor Overhead and Profit	12%			\$330,742
Construction Contingencies	5%			\$137,809
Total				\$3,500,000

INPUTS

Estimating Contingency (Rehab)	30%
Estimating Contingency (New)	20%
Escalation to Midpoint	3%
Contractor General Conditions	10%
Contractor Overhead and Profit	12%
Permitting	0.0%
Construction Contingencies	5%
Effective Multiplier Used (Rehab)	1.69
Effective Multiplier Used (New)	1.56