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April 8, 2003

HAND DELIVERY

Ms. Blanca Bayo, Director
Division of the Commission Clerk and Administrative Services
Florida Public Service Commission
2540 Shumard Oak Boulevard
Tallahassee, FL 32399-0850

Re: Docket No. 020408-SU;Alafaya Utilities, Inc.; Application for Rate Increase in Seminole County, Florida
Our File No. 30057.46

Dear Ms. Bayo:

Enclosed please find for filing in the above-referenced docket, the original and five (5) copies of Alafaya Utilities, Inc.'s Supplemental Original Cost Study dated March, 2003.

Very truly yours,

MARTIN S. FRIEDMAN
For the Firm

MSF/dmp
Enclosures

cc: Mr. Steven M. Lubertozzi (w/o enclosure)
Mr. Donald Rasmussen (w/o enclosure)
Mr. David L. Orr (w/o/enclosure)
Mr. Frank Seidman (w/o enclosure)

DOCUMENT NUMBER-DATE
03286 APR-8 8
FPSC-COMMISSION CLERK

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In re: Application of
ALAFAYA UTILITIES, INC.
for a rate increase in Seminole County

DOCKET NO. 020408-SU

NOTICE OF FILING

Applicant, ALAFAYA UTILITIES, INC., hereby notices the filing of its Supplemental Original Cost Study dated March, 2003, in the above-referenced docket.

Respectfully submitted on this
8th day of April, 2003 by:

ROSE, SUNDSTROM & BENTLEY, LLP
600 S. North Lake Boulevard
Suite 160
Altamonte Springs, Florida 32701
(407) 830-6331
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By: _____
MARTIN S. FRIEDMAN

Utilities\Alafaya Utilities Rate Case\NOFSupp Org Cost Study

DOCUMENT NO.
03286-03
4/8/03

ALAFAYA UTILITIES, INC.

SUPPLEMENT TO
ORIGINAL COST STUDY

PURCHASED
WASTEWATER SYSTEM

Prepared for

ALAFAYA UTILITIES, INC.

March, 2003

Management & Regulatory Consultants, Inc.

ALAFAYA UTILITIES, INC.

SUPPLEMENT TO
ORIGINAL COST STUDY

PURCHASED
WASTEWATER SYSTEM

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SECTION II. THE ORIGINAL COST STUDY

ALAFAYA UTILITIES, INC.

SUPPLEMENT TO
ORIGINAL COST STUDY

PURCHASED
WASTEWATER SYSTEM

SECTION I. INTRODUCTION

I-1. BACKGROUND and PURPOSE

The Original Cost Study, dated December, 2002, included work performed by Fore Golf, Inc. for the construction of the Twin Rivers Golf Course Effluent Disposal Facility (TRGC Disposal Facility). The original cost of the work performed totaled $1,273,353. The documentation provided to support the costs were a contract Subsidiary Ledger listing payments totaling the $1,273,353 and two purchase orders totaling $288,720 which amount was a part of the subsidiary ledger total.

After reviewing the Study, Florida Public Service Commission (PSC) Staff requested more specific support for these costs, including an explanation and identification of the assets which these costs purported to cover.

The purpose of this Supplement is to provide further support for the cost of constructing the TRGC Disposal Facility.

I-2. SUMMARY

The cost supported by this Supplement versus the cost set out in the Subsidiary Ledger is:

	Original Cost	Accum. Depr.	Net Plant @ 12/31/01
Per Supplement	$1,052,808	$ 346,913	$705,895
Per Sub. Ledger	1,273,353	863,199	410,154
Difference	$ (220,545)	$(516,286)	$295,741

The cost as set out in the Subsidiary Ledger is summarized in Table A. The cost as determined in this Supplement is summarized in Table B.

It should not be concluded from this differential, that the cost contained in the subsidiary ledger is incorrect. First, without specific knowledge of the components of the costs contained in

the subsidiary ledger, the costs can neither be confirmed nor rejected. All that can be concluded is that the costs determined in this Supplement are different from those included in the subsidiary ledger. Second, the costs determined in this Supplement do not include the costs of certain majors items of plant that are in existence, but not in use. Specifically, this Supplement does not include the costs associated with an existing practice range pump station and related piping, and a river intake and its related wetwell and augmentation pump station. The cost of these items may very well represent the difference in the costs recorded on the subsidiary ledger and the costs determined in this Supplement.

For expediency and cost control in the preparation of this Supplement, an estimate of the cost of the items not in use has not been made at this time. Since they are not in use, this will not affect rate base. Should the utility place these items in service at some future date, or determine that they should prudently be abandoned, a cost determination will become necessary.

SECTION II. THE ORIGINAL COST STUDY

II-1. DESCRIPTION OF NEW DOCUMENTATION

Several avenues were explored to obtain documentation of the assets constructed. The task was exacerbated by the fact that the engineering firm that planned the facility (Commonwealth Engineering Associates), the firm that constructed the facility (Fore Golf, Inc.), and the developer (Anden Group of Florida) are no longer in business. These would have been the most logical sources of original documentation. Fortunately, an engineer that had been employed by Commonwealth was found and he was able to provide a set of "as-built" plans, as of 3/7/91. Using this 18 page document and an on-site visit to the TRGC Disposal Facility, current costs of the facility components were estimated. A set of the "as-built" plans accompanies this Supplement.

II-2. DESCRIPTION OF THE TRGC DISPOSAL SYSTEM ASSETS

The major operating components of the TRGC Disposal Facility are:

A wet weather holding pond.

An irrigation pump station consisting of 2-75HP pumps, 1-25HP pump, a 300 gallon tank, various valves, piping and appurtenances, and electrical control panels.

A pump house including the necessary concrete padding and precast wetwell.

Approximately 73,000 feet of PVC pipe, ranging in size from 2.5" - 10" diameter, 33 isolation valves, 778 sprinkler heads, and 34 remote sprinkler controls.

In addition to the above, there exists a practice range pump station and related piping, and a river intake, related wetwell and augmentation pump station. Based on the on-site inspection and conversations with the golf course personnel, it was determined that these facilities are not now being used, and have not been in use for sometime beginning in the period between 1991, when the "as-built" plans were completed, and 1994 when Alafaya Utilities, Inc. was purchased by its present owner. For purposes of this Supplement, a cost for these facilities has not been established and the cost is not included in the original cost determination of Plant in Service. The specifications for the practice range pump station and piping is found on Sheets 3 and 9 of the "as-built" plans. The specifications for the river intake, related wetwell and augmentation pump station are found on Sheets 10-12 of the plans.

II-3. COSTING APPROACH

The "as-built" plans and on-site inspection of the system were utilized to develop the quantities and characteristics of the plant items to be costed. Base year installed costs were determined using recognized construction cost manuals, requested manufacture quotations and manufacture catalogs. These base costs were then indexed to the in-service year using recognized construction indexes. Portions of the costs were estimated by Management & Regulatory Consultants, Inc. and portions were estimated by Milian Swain and Associates. The work papers and supporting documentation are contained in Appendix A and Appendix B, respectively.

Accumulated depreciation was determined using PSC depreciable lives. It should be noted that in the original December, 2002 Study, when the individual components of the TRGC Disposal Facility were not specifically identified, the 18 year depreciable life associated with Account 380, Treatment & Disposal Equipment was utilized. In this Supplement, depreciable lives associated with the identified plant categories were used. Since these components are essentially those of a water distribution system, PSC depreciable lives of related water plant categories were utilized.

II-4. ESTIMATED ORIGINAL COST

The original cost of the TRGC Disposal Facility, placed in service in approximately 1988, is estimated to be **$1,052,808.** This is the estimated costs of the portions actually in service and does not include the cost of the non used practice range pump and piping or the river intake, wetwell and augmentation pump, as previously discussed. The original cost, net of accumulated depreciation at 12/31/01, is estimated to be **$705,895.**

--- END OF TEXT –

ALAFAYA UTILITIES, INC.

SUPPLEMENT TO
ORIGINAL COST STUDY

PURCHASED
WASTEWATER SYSTEM

TABLES

TABLE A
ALAFAYA UTILITIES, INC.

SUMMARY OF TRGC EFFLUENT DISPOSAL FACILTY COSTS
AS REPRESENTED IN ORIGINAL COST STUDY - DECEMBER, 2002

SUB LEDGER - Fore Golf, Inc.
Costs related to Twin Rivers Golf Course Effluent Disposal Facility

Invoice No.	Invoice Date	Original Cost	NARUC Acct	Deprec. Life	Annual Depr.	In-Service Year	Years In-Service *	Accum. Depr.	Net Plant
669	1988	112,626	380	18	6,257.00	1988	13.0	81,341	31,285
683	1988	144,721	380	18	8,040.03	1988	13.0	104,520	40,200
700	1989	191,350	380	18	10,630.54	1989	12.0	127,566	63,783
700	1989	41,966	380	18	2,331.44	1989	12.0	27,977	13,989
710	1989	174,621	380	18	9,701.14	1989	12.0	116,414	58,207
P.O. 69495	03-Feb-89	160,175	380	18	8,898.63	1989	12.0	106,784	53,392
726	1989	312,423	380	18	17,356.86	1989	12.0	208,282	104,141
P.O. 69552	09-Mar-89	128,545	380	18	7,141.39	1989	12.0	85,697	42,848
727	1989	6,926	380	18	384.80	1989	12.0	4,618	2,309
	Totals	1,273,353			70,741.83			863,199	410,154

* Assumes 1/2 year depreciation in in-service year and test year.

TABLE B
ALAFAYA UTILITIES, INC

SUMMARY OF TRGC EFFLUENT DISPOSAL FACILTY COSTS
AS ESTIMATED FROM AS-BUILT PLANS and ON-SITE INSPECTION

Base Yr (1)	Description	Base Cost (2)	Base Yr Source (3)	Base Yr Index (4)	In-Service Index (5)	Index Source (6)	Original Cost	NARUC Acct (7)	Deprec. Life	Annual Depr.	In-Service Year	Years In-Service *	Accum Depr.	Net Plant
2003	PVC Mains	638,301	MRC	225	183	H-W, W-2,38	519,151	331	45	11,536 70	1988	13 0	149,977	369,174
2003	Valves, etc	54,038	MRC	225	183	H-W, W-2,38	43,951	331	25	1,758 05	1988	13 0	22,855	21,097
2003	Sprinkler Heads	27,387	MRC	225	183	H-W, W-2,38	22,275	est	10	2,227.46	1988	13.0	15,633	6,642
2003	Holding Pond	237,900	MSA	6597	4519	ENR	162,963	305	50	3,259 27	1988	13.0	42,371	120,593
2003	Pond Fence	35,617	MRC	6597	4519	ENR	24,398	304	33	739.33	1988	13 0	9,611	14,787
2003	Pumps	157,000	MSA	6597	4519	ENR	107,546	304	32	3,360 82	1988	13 0	43,691	63,856
2003	Hydro Tank	3,959	MRC	275	221	H-W, W-2,23	3,182	330	35	90 90	1988	13.0	1,182	2,000
2003	Pump House	31,200	MSA	6597	4519	ENR	21,372	304	33	647 64	1988	13 0	8,419	12,953
2003	Monitoring Wells	5,700	MRC	326	227	H-W, W-2,8	3,969	307	20	198 45	1988	13 0	2,580	1,389
1988/9	Special Fill	144,000	Purch. Ord	-----	-----	-----	144,000	330	37	3,891 89	1988	13.0	50,595	93,405
	Totals	1,335,102					1,052,808			27,710 51			346,913	705,895

* Assumes 1/2 year depreciation in in-service year and test year

(1) Base Year - the year in which a cost basis has been established through a reasonable costing source
(2) Base Cost - the estimated cost as if it were constructed in the base year.
(3) Base Yr Source - the source of the reference costing information.
MRC - Management & Regulatory Consultants, Inc.
MSA - Milian Swain and Associates
(4) Base Yr Index - the value of the cost trend index number for the base year.
(5) In-service Index - the value of the cost trend index number for the in-service year
(6) Index Source - the source of the index used to trend cost from the base year to the in-service year.
HW, W-x,y - Handy Whitman, page number, line
ENR - Engineering News Record
(7) NARUC Acct - the account on which depreciable life is based Regardless of which account is used, all costs are to be booked under Account 380.

Appendix A

APPENDIX A

Management & Regulatory Consultants, Inc.
Workpapers and Supporting Documentation

ALAFAYA UTILITIES, INC.
TWIN RIVERS GOLF COURSE EFFLUENT DISPOSAL FACILITY
MAP TAKEOFFS

MAP TAKEOFF in Inches

SHEET	2.5 " PVC	3" PVC	4" PVC	6" PVC	8" PVC	10" PVC
3	59.20	0.00	30.50	5 10	26.20	9.50
4	108.70	0.00	29.80	28 50	1.00	0.00
5	47.50	2.20	41.80	15.50	0.00	0.00
6	46.50	0.00	0.00	0.00	20.00	0.00
7	70.70	0.00	15.10	23.50	0.00	0.00
8	107.50	0.00	25.30	17.00	0.00	0.00
Total	440.10	2.20	142.50	89.60	47.20	9.50

MAP TAKEOFF in Feet (1 " = 100 ')

SHEET	2.5 " PVC	3" PVC	4" PVC	6" PVC	8" PVC	10" PVC
3	5,920	0	3,050	510	2,620	950
4	10,870	0	2,980	2,850	100	0
5	4,750	220	4,180	1,550	0	0
6	4,650	0	0	0	2,000	0
7	7,070	0	1,510	2,350	0	0
8	10,750	0	2,530	1,700	0	0
Total, LF	44,010	220	14,250	8,960	4,720	950
Unit cost, LF	$6.28	$7.98	$9.28	$13.78	$22.13	$25.03
	$276,383	$1,756	$132,240	$123,469	$104,454	$23,779
Grand Total						$638,301

Unit Cost of 10" PVC not available; estimate based on ratios of $/LF to cost of 2.5" PVC

Unit Cost, LF	5.65	7.35	8.65	13.15	21.50	**24.40**
Trenching	0.63	0.63	0.63	0.63	0.63	0.63
Total, $/LF	6.28	7.98	9.28	13.78	22.13	25.03
Ratio: $/LF w/o trenching	1.000000	1.300885	1.530973	2.327434	3.805310	**4.318584**

Linear Regression Analysis of Ratios of $/LF

1	1.300885	0.994690
2	1.530973	1.825664
3	2.327434	2.656637
4	3.805310	3.487611
5		4.318584

Regression Output:

Constant	0 16371681
Std Err of Y Est	0 44153439
R Squared	0.89852797
No. of Observations	4
Degrees of Freedom	2
X Coefficient(s)	0.83097345
Std Err of Coef	0.19746018

HOLDING POND CHAIN LINK FENCE

	Units		$/Unit	Cost
6' High galv. steel fence	1,600	LF	21.50	34,400
20' opening double swing gate	1	EA	1,217.00	1,217
				35,617

ALAFAYA UTILITIES, INC.
TWIN RIVERS GOLF COURSE EFFLUENT DISPOSAL FACILITY

Toro Sprinkler Heads

	Adj. 12 circ.	Full Circle	Full Circle	Full Circle	Remote
SHEET	655-01-58	684-01-88	674-01-70	674-01-73	Controllers
3	118	0	8	78	8
4	110	1	12	49	9
5	43	0	8	61	4
6	40	0	6	19	2
7	71	0	2	25	4
8	77	0	3	47	7
Total	459	1	39	279	34
Unit Cost, ea	$14.00	$14.00	$14.00	$14.00	$255.00
Install @40%	5.60	5.60	5.60	5.60	102.00
Total, ea	$19.60	$19.60	$19.60	$19.60	$357.00
Total	$8,996	$20	$764	$5,468	$12,138
Grand Total					$27,387

Isolation Valves

SHEET	2.5"	3"	4"	6"	8"	10"
3	8	0	6	1	3	1
4	0	0	4	0	0	0
5	0	1	3	0	0	0
6	0	0	0	0	0	0
7	0	0	1	2	0	0
8	0	0	2	1	0	0
Total	8	1	16	4	3	1
Unit cost, ea	$1,000.00	$1,025.00	$1,300.00	$2,050.00	**$3,774.57**	**$4,689.58**
Total	$8,000	$1,025	$20,800	$8,200	$11,324	$4,690
Grand Total						$54,038

Unit Cost of 8" & 10" Valves not available; estimate based on ratios $/Unit to cost of 2.5" Valves

Unit Cost, ea	5.65	7.35	8.65	13.15	21.50	**26.50**
Trenching	0.63	0.63	0.63	0.63	0.63	0.63
Total, $/LF	6.28	7.98	9.28	13.78	22.13	27.13
Ratio: $/LF	1.000000	1.025000	1.300000	2.050000	**3.774566**	**4.689578**

Linear Regression Analysis of Ratios of $/Unit

1	1.025000	1.029531
2	1.300000	1.944543
3	2.050000	2.859554
4		3.774566
5		4.689578

Regression Output:

Constant	0.11451905
Std Err of Y Est	0.1836783
R Squared	0.93319763
No. of Observations	3
Degrees of Freedom	1
X Coefficient(s)	0.91501177
Std Err of Coef.	0.24481375

RSMeans®

Building Construction Cost Data

61st Annual Edition

2003

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	02315 | Excavation and Fill	CREW	DAILY OUTPUT	LABOR-HOURS	UNIT	2003 BARE COSTS MAT	LABOR	EQUIP.	TOTAL	TOTAL INCL O&P	
0350	2 1/2 C.Y. bucket, minimum haul	B-10T	600	.020	C.Y.		.60	.52	1.12	1.48	900
0352	100' haul	"	300	.040	↓		1.20	1.04	2.24	2.98	
0910	EXCAVATING, UTILITY TRENCH Common earth										940
0950	Trenching with chain trencher, 12 H.P., operator walking										
0100	4" wide trench, 12" deep	B-53	800	.010	L.F.		.31	.10	.41	.58	
0150	18" deep		750	.011			.33	.11	.44	.62	
0200	24" deep		700	.011			.36	.11	.47	.66	
0300	6" wide trench, 12" deep		650	.012			.38	.12	.50	.71	
0350	18" deep		600	.013			.41	.13	.54	.78	
0400	24" deep		550	.015			.45	.14	.59	.85	
0450	36" deep		450	.018			.55	.18	.73	1.03	
0600	8" wide trench, 12" deep		475	.017			.52	.17	.69	.97	
0650	18" deep		400	.020			.62	.20	.82	1.16	
0700	24" deep		350	.023			.71	.23	.94	1.33	
0750	36" deep	↓	300	.027	↓		.83	.26	1.09	1.55	
1000	Backfill by hand including compaction, add										
1050	4" wide trench, 12" deep	A-1	890	.010	L.F.		.25	.07	.32	.47	
1100	18" deep		530	.015			.37	.11	.48	.70	
1150	24" deep		400	.020			.49	.14	.63	.93	
1300	6" wide trench, 12" deep		540	.015			.37	.11	.48	.69	
1350	18" deep		405	.020			.49	.14	.63	.92	
1400	24" deep		270	.030			.73	.21	.94	1.37	
1450	36" deep		180	.044			1.10	.32	1.42	2.06	
1600	8" wide trench, 12" deep		400	.020			.49	.14	.63	.93	
1650	18" deep		265	.030			.74	.22	.96	1.40	
1700	24" deep		200	.040			.99	.29	1.28	1.86	
1750	36" deep	↓	135	.059	↓		1.46	.43	1.89	2.75	
2000	Chain trencher, 40 H.P., operator riding										
2050	6" wide trench and backfill, 12" deep	B-54	1,200	.007	L.F.		.21	.18	.39	.50	
2100	18" deep		1,000	.008			.25	.21	.46	.61	
2150	24" deep		975	.008			.26	.22	.48	.63	
2200	36" deep		900	.009			.28	.23	.51	.68	
2250	48" deep		750	.011			.33	.28	.61	.81	
2300	60" deep		650	.012			.38	.32	.70	.94	
2400	8" wide trench and backfill, 12" deep		1,000	.008			.25	.21	.46	.61	
2450	18" deep		950	.008			.26	.22	.48	.64	
2500	24" deep		900	.009			.28	.23	.51	.68	
2550	36" deep		800	.010			.31	.26	.57	.76	
2600	48" deep		650	.012			.38	.32	.70	.94	
2700	12" wide trench and backfill, 12" deep		975	.008			.26	.22	.48	.63	
2750	18" deep		860	.009			.29	.25	.54	.71	
2800	24" deep		800	.010			.31	.26	.57	.76	
2850	36" deep		725	.011			.34	.29	.63	.84	
2900	16" wide trench and backfill, 12" deep		835	.010			.30	.25	.55	.73	
3050	18" deep		750	.011			.33	.28	.61	.81	
3100	24" deep	↓	700	.011	↓		.36	.30	.66	.87	
3200	Compaction with vibratory plate, add								50%	50%	
5100	Hand excavate and trim for pipe bells after trench excavation										
5200	8" pipe	1 Clab	155	.052	L.F.		1.27		1.27	1.99	
5300	18" pipe	"	130	.062	"		1.52		1.52	2.37	
	02320 | Hauling										
0010	HAULING Excavated or borrow material, loose cubic yards R02315-400										200
0015	no loading included, highway haulers										
0020	6 C.Y. dump truck, 1/4 mile round trip, 5.0 loads/hr	B-34A	195	.041	C.Y.		1.05	1.57	2.62	3.34	
0030	1/2 mile round trip, 4.1 loads/hr ↓	↓	160	.050	↓		1.28	1.91	3.19	4.06	

02465 | Bored Piles

			CREW	DAILY OUTPUT	LABOR-HOURS	UNIT	2003 BARE COSTS MAT.	LABOR	EQUIP.	TOTAL	TOTAL INCL O&P
1000	80 to 100 ton capacity, 16" diameter, 20' depth	R02465-800	B-44	160	.400	V.L.F.	20	12.45	6.35	38.80	49
1100	40' depth			230	.278		18.65	8.65	4.41	31.71	39.50
1200	110 to 140 ton capacity, 17-5/8" diameter, 20' depth			160	.400		21.50	12.45	6.35	40.30	50.50
1300	40' depth			230	.278		20	8.65	4.41	33.06	41
1400	140 to 175 ton capacity, 19" diameter, 20' depth			130	.492		23.50	15.30	7.80	46.60	59
1500	40' depth			210	.305		21.50	9.45	4.83	35.78	44
1700	Over 30' long, L.F. cost tends to be lower										
1900	Maximum depth is about 90'										

02510 | Water Distribution

			CREW	DAILY OUTPUT	LABOR-HOURS	UNIT	2003 BARE COSTS MAT.	LABOR	EQUIP.	TOTAL	TOTAL INCL O&P
0010	PIPING, WATER DISTRIBUTION SYSTEMS Pipe, laid	R02510-800									
0020	in trench, excavation and backfill not included										
1400	Ductile iron, cement lined, class 50 water pipe, 18' lengths										
1410	Mechanical joint, 4" diameter		B-20	144	.167	L.F.	9.65	4.64		14.29	17.90
1420	6" diameter			126	.190		9.90	5.30		15.20	19.15
1430	8" diameter			108	.222		13.55	6.20		19.75	24.50
1440	10" diameter			90	.267		15.90	7.45		23.35	29
1450	12" diameter	CN	B-21	72	.389		19.80	11.15	2.27	33.22	42
1460	14" diameter			54	.519		25	14.90	3.02	42.92	54
1470	16" diameter			46	.609		27.50	17.45	3.55	48.50	61
1480	18" diameter			42	.667		35.50	19.15	3.89	58.54	73
1490	24" diameter			35	.800		55.50	23	4.66	83.16	102
1550	Push on joint, 4" diameter		B-20	155	.155		6.95	4.31		11.26	14.40
1560	6" diameter			135	.178		7.85	4.95		12.80	16.40
1570	8" diameter			115	.209		11.20	5.80		17	21.50
1580	10" diameter			98	.245		17.05	6.80		23.85	29.50
1590	12" diameter			78	.308		17.95	8.55		26.50	33
1600	14" diameter		B-21	58	.483		19.75	13.85	2.81	36.41	46
1610	16" diameter			52	.538		27.50	15.45	3.14	46.09	57.50
1620	18" diameter			43	.651		30.50	18.70	3.80	53	66.50
1630	20" diameter			41	.683		33.50	19.60	3.98	57.08	72
1640	24" diameter			40	.700		44	20	4.08	68.08	84
1950	Butterfly valves with boxes, cast iron										
1970	4" diameter		B-20	6	4	Ea.	360	111		471	570
1990	6" diameter		"	5	4.800		485	134		619	745
2010	8" diameter		B-21	4	7		725	201	41	967	1,150
2030	10" diameter			3.50	8		955	230	46.50	1,231.50	1,450
2050	12" diameter			3	9.333		1,325	268	54.50	1,647.50	1,925
2070	14" diameter			2	14		1,800	400	81.50	2,281.50	2,700
2090	16" diameter			2	14		2,225	400	81.50	2,706.50	3,175
2650	Polyvinyl chloride pipe, class 160, S.D.R.-26, 1-1/2" diameter		B-20	300	.080	L.F.	59	2.23		2.82	4.13
2700	2" diameter			250	.096		89	2.67		3.56	5.15
2750	2-1/2" diameter			250	.096		1.32	2.67		3.99	5.65
2800	3" diameter			200	.120		1.89	3.34		5.23	7.35
2850	4" diameter			200	.120		3.09	3.34		6.43	8.65
2900	6" diameter			180	.133		6.65	3.71		10.36	13.15
2950	8" diameter		B-21	160	.175		11.30	5	1.02	17.32	21.50
8000	Fittings, ductile iron, mechanical joint										

15110 | Valves

		CREW	DAILY OUTPUT	LABOR-HOURS	UNIT	2003 BARE COSTS MAT	LABOR	EQUIP.	TOTAL	TOTAL INCL O&P
	For CPVC, flanged, add				Ea	65%	15%			
1680	For true union, socket or threaded, add				↓	50%	5%			
2050	Polypropylene, threaded									
2100	1/4"	1 Plum	26	.308	Ea	33	11.50		44.50	54
2120	3/8"		26	.308		33	11.50		44.50	54
2130	1/2"		26	.308		33	11.50		44.50	54
2140	3/4"		25	.320		41	11.95		52.95	63.50
2150	1"		23	.348		49	13		62	73.50
2160	1 1/4"		21	.381		71	14.25		85.25	99.50
2170	1-1/2"		20	.400		82	14.95		96.95	113
2180	2"	↓	17	.471	↓	111	17.60		128.60	149
4850	Foot valve, PVC, socket or threaded									
4900	1/2"	1 Plum	34	.235	Ea	45	8.80		53.80	63
4930	3/4"		32	.250		51	9.35		60.35	70
4940	1"		28	.286		66.50	10.65		77.15	89
4950	1-1/4"		27	.296		127	11.05		138.05	156
4960	1-1/2"	↓	26	.308	↓	127	11.50		138.50	156
6350	Y sediment strainer, PVC, socket or threaded									
6400	1/2"	1 Plum	26	.308	Ea	32.50	11.50		44	53
6440	3/4"		24	.333		35.50	12.45		47.95	58
6450	1"		23	.348		43	13		56	67
6460	1-1/4"		21	.381		71	14.25		85.25	99.50
6470	1-1/2"	↓	20	.400	↓	71	14.95		85.95	101
0010	VALVES, STEEL									
0800	Cast									
1350	Check valve, swing type, 150 lb., flanged									
1400	2"	1 Plum	8	1	Ea	465	37.50		502.50	570
1440	2-1/2"	Q-1	5	3.200		505	108		613	720
1450	3"		4.50	3.556		595	120		715	835
1460	4"	↓	3	5.333		875	179		1,054	1,225
1540	For 300 lb., flanged, add					50%	15%			
1548	For 600 lb., flanged, add				↓	110%	20%			
1950	Gate valve, 150 lb., flanged									
2000	2"	1 Plum	8	1	Ea	540	37.50		577.50	650
2040	2-1/2"	Q-1	5	3.200		765	108		873	1,000
2050	3"		4.50	3.556		765	120		885	1,025
2060	4"	↓	3	5.333		930	179		1,109	1,300
2070	6"	Q-2	3	8	↓	1,475	279		1,754	2,050
3650	Globe valve, 150 lb., flanged									
3700	2"	1 Plum	8	1	Ea	675	37.50		712.50	800
3740	2-1/2"	Q-1	5	3.200		850	108		958	1,100
3750	3"		4.50	3.556		850	120		970	1,125
3760	4"	↓	3	5.333		1,250	179		1,429	1,650
3770	6"	Q-2	3	8	↓	1,950	279		2,229	2,575
5150	Forged									
5650	Check valve, class 800, horizontal, socket									
5698	Threaded									
5700	1/4"	1 Plum	24	333	Ea	41	12.45		53.45	64
5720	3/8"		24	333		41	12.45		53.45	64
5730	1/2"		24	333		41	12.45		53.45	64
5740	3/4"		20	400		44.50	14.95		59.45	71.50
5750	1"		19	421		52	15.75		67.75	81
5760	1-1/4"	↓	15	533	↓	99.50	19.90		119.40	139

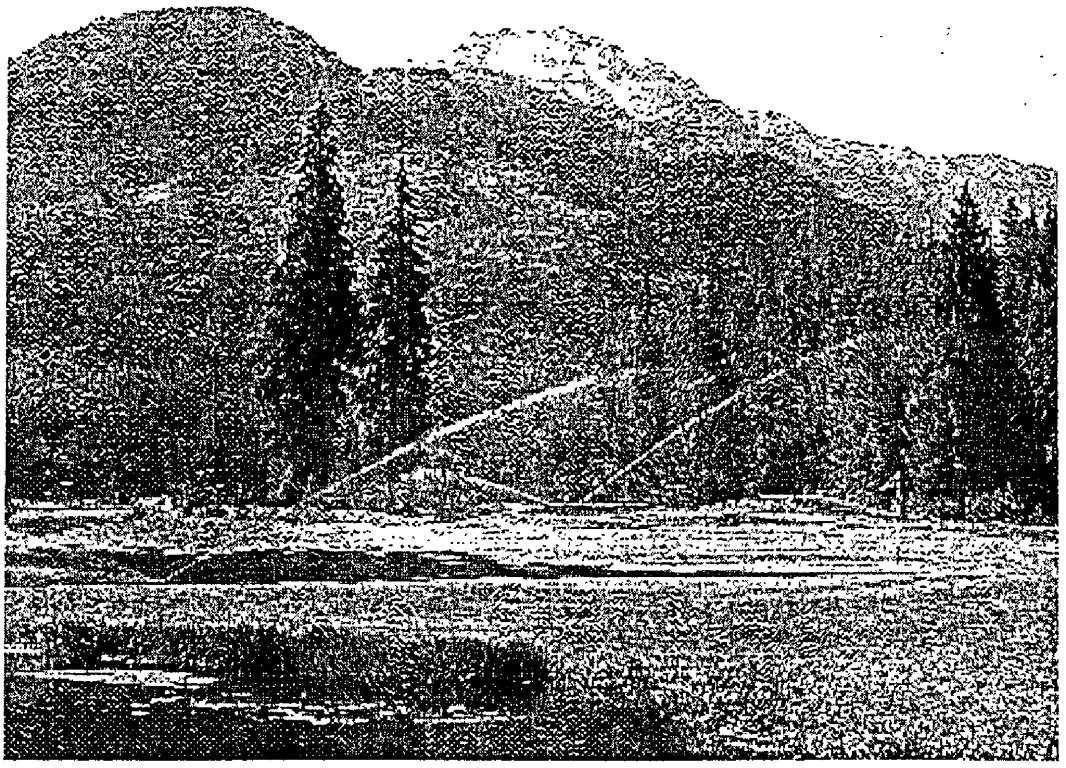
2810 | Irrigation System	CREW	DAILY OUTPUT	LABOR-HOURS	UNIT	2003 BARE COSTS MAT	LABOR	EQUIP	TOTAL	TOTAL INCL O&P	
?	2 Skwk	?	S	Ea	152	258		410	570	800
2815 | Fountains										
FOUNTAINS/AERATORS										225
Pump w/controls										
Single phase, 100' cord, 1/2 H.P. pump	2 Skwk	4.40	3.636	Ea	2,550	117		2,667	3,000	
3/4 H.P. pump		4.30	3.721		2,925	120		3,045	3,400	
1 H.P. pump		4.20	3.810		2,950	123		3,073	3,450	
1 1/2 H.P. pump		4.10	3.902		3,050	126		3,176	3,550	
2 H.P. pump		4	4		3,100	129		3,229	3,600	
Three phase, 200' cord, 5 H.P. pump		3.40	4.103		7,475	132		7,607	8,425	
7 1/2 H.P. pump		3.30	4.211		8,450	136		8,586	9,525	
10 H.P. pump		3.70	4.324		9,425	139		9,564	10,600	
15 H.P. pump		3.60	4.444		11,200	143		11,343	12,500	
Nozzles, minimum		8	2		187	64.50		251.50	305	
Maximum		8	2		246	64.50		310.50	370	
Lights w/mounting kits, 200 watt		18	.889		310	28.50		338.50	385	
300 watt		18	.889		345	28.50		373.50	420	
500 watt		18	.889		375	28.50		403.50	460	
Color blender	▼	12	1.333	▼	292	43		335	390	
2820 | Fences & Gates										
FENCE, MISC. METAL, Chicken wire, posts @ 4', 1" mesh, 4' high	B-80	4.6	.878	L.F.	1.21	2.09	.22	4.52	5.90	500
2" mesh, 6' high		350	.091		1.10	2.45	.43	4.98	6.55	
Galv. steel, 12 ga., 2" x 4" mesh, posts 5' O.C., 3' high		300	.107		1.65	2.86	1.66	6.17	8.05	
5' high		300	.107		2.20	2.86	1.66	6.72	8.65	
14 ga., 1" x 2" mesh, 3' high		300	.107		1.76	2.86	1.66	6.28	8.20	
5' high	▼	300	.107	▼	2.43	2.86	1.66	6.95	8.90	
Kennel fencing, 1 1/2" mesh, 6' long, 3'-6" wide, 6'-2" high	2 Clab	4	4	Ea	276	98.50		374.50	460	
12' long		4	4		330	98.50		428.50	520	
Top covers, 1 1/2" mesh, 6' long		15	1.067		56	26.50		82.50	103	
12' long	▼	12	1.333	▼	89.50	33		122.50	150	
For kennel doors, see division 08344.350										
Security fence, prison grade, set in concrete, 12' high	B-80	25	1.280	L.F.	23	34.50	19.95	77.45	100	
16' high		20	1.600		27.50	43	25	95.50	124	
Tubular picket, steel, 6' sections, 1 9/16" posts, 4' high		300	.107		17.10	2.86	1.66	21.62	25	
5' posts, 5' high		240	.133		23.50	3.58	2.08	29.16	34	
2" posts, 6' high		200	.160		27	4.29	2.50	33.79	39	
Staggered picket 1-9/16" posts, 4' high		300	.107		15.45	2.86	1.66	19.97	23	
5' posts, 5' high		240	.133		25.50	3.58	2.08	31.16	36	
2" posts, 6' high	▼	200	.160	▼	26.50	4.29	2.50	33.29	38.50	
Gates, 4' high, 3' wide	B-1	10	2.400	Ea.	149	61		210	259	
5' high, 3' wide		10	2.400		193	61		254	305	
6' high, 3' wide		10	2.400		199	61		260	315	
4' wide	▼	10	2.400	▼	232	61		293	350	
FENCE, CHAIN LINK, INDUSTRIAL, schedule 40										528
3 strands barb. wire, 2" post @ 10' O.C., set in concrete, 5' H										
9 ga. wire, galv. steel	B-80	340	.094	L.F.	8.05	3.58	2.08	13.71	16.65	
Aluminized steel		240	.133		10.35	5.05	2.93	18.33	22	
6 ga. wire, galv. steel		300	.107		14.90	3.58	2.08	20.56	24	
Aluminized steel		240	.133		12.60	3.43	2	18.03	21.50	
6 ga. wire, 6' high but omit barbed wire, galv. steel		250	.128		17.65	3.43	2	23.08	27	
Aluminized steel	▼	250	.128	▼						

02820 | Fences & Gates

			DAILY	LABOR-		2003 BARE COSTS				TOTAL
		CREW	OUTPUT	HOURS	UNIT	MAT.	LABOR	EQUIP.	TOTAL	INCL. O&P
0920	8' H, 6 ga. wire, 2-1/2" line post, galv. steel	B-80	180	.178	L.F.	20.50	4.77			
0940	Aluminized steel		180	.178		25.50	4.77			
1100	Add for corner posts, 3" diam., galv. steel		40	.800	Ea.	61.50	21.50	12.50	95.50	
1200	Aluminized steel		40	.800		73.50	21.50	12.50	107.50	
1300	Add for braces, galv. steel		80	.400		16.70	10.75	6.25	33.70	
1350	Aluminized steel		80	.400		22.50	10.75	6.25	39.50	
1400	Gate for 6' high fence, 1-5/8" frame, 3' wide galv. steel		10	3.200		98	86	50	234	
1500	Aluminized steel		10	3.200		120	86	50	256	
2000	5'-0" high fence, 9 ga., no barbed wire, 2" line post,									
2010	10' O.C., 1-5/8" top rail									
2100	Galvanized steel	B-80	300	.107	L.F.	6.70	2.86	1.66	11.22	
2200	Aluminized steel		300	.107		9.10	2.86	1.66	13.62	
2400	Gate, 4' wide, 5' high, 2" frame, galv. steel		10	3.200	Ea.	111	86	50	247	
2500	Aluminized steel		10	3.200		123	86	50	259	
3100	Overhead slide gate, chain link, 6' high, to 18' wide		36	.842	L.F.	98	22.50	13.15	133.65	
3110	Cantilever type		48	.667		42.50	17.90	10.40	70.80	
3120	8' high		24	1.333		61.50	36	21	118.50	
3130	10' high		18	1.778		72.50	47.50	27.50	147.50	
5000	Double swing gates, incl. posts & hardware									
5010	5' high, 12' opening	B-80	3.40	9.412	Opng.	299	253	147	699	
5020	20' opening		2.80	11.429		405	305	178	888	
5060	6' high, 12' opening		3.20	10		505	268	156	929	
5070	20' opening		2.60	12.308		695	330	192	1,217	
5080	8' high, 12' opening		2.13	15.002		785	405	234	1,424	
5090	20' opening		1.45	22.069		1,025	592	345	1,962	
5100	10' high, 12' opening		1.31	24.427		890	655	380	1,925	
5110	20' opening		1.03	31.068		1,350	835	485	2,670	
5120	12' high, 12' opening		1.05	30.476		1,300	820	475	2,595	
5130	20' opening		85	37.647		1,675	1,000	585	3,260	
5190	For aluminized steel add					20%				
7001	Snow fence on steel posts 10' O.C., 4' high	B-1	500	.048	L.F.	1.65	1.22		2.87	
0010	FENCE, CHAIN LINK RESIDENTIAL, sch. 20, 11 ga. wire, 1-5/8" post									
0020	10' O.C., 1-3/8" top rail, 2" corner post, galv. stl. 3' high	B-1	500	.048	L.F.	2.67	1.22		3.89	
0050	4' high		400	.060		3.03	1.52		4.55	
0100	6' high		200	.120		3.68	3.04		6.72	
0150	Add for gate 3' wide, 1-3/8" frame, 3' high		12	2	Ea.	40	50.50		90.50	
0170	4' high		10	2.400		46	61		107	
0190	6' high		10	2.400		63	61		124	
0200	Add for gate 4' wide, 1-3/8" frame, 3' high		9	2.667		45	67.50		112.50	
0220	4' high		9	2.667		51	67.50		118.50	
0240	6' high		8	3		59.50	76		135.50	
0350	Aluminized steel, 11 ga. wire, 3' high		500	.048	L.F.	3.46	1.22		4.68	
0380	4' high		400	.060		4.44	1.52		5.96	
0400	6' high		200	.120		6.25	3.04		9.29	
0450	Add for gate 3' wide, 1-3/8" frame, 3' high		12	2	Ea.	48	50.50		98.50	
0470	4' high		10	2.400		78.50	61		139.50	
0490	6' high		10	2.400		99	61		160	
0500	Add for gate 4' wide, 1-3/8" frame, 3' high		10	2.400		54.50	61		115.50	
0520	4' high		9	2.667		60	67.50		127.50	
0540	6' high		8	3		69.50	76		145.50	
0620	Vinyl covered, 9 ga. wire, 3' high		500	.048	L.F.	2.88	1.22		4.10	
0640	4' high		400	.060		3.37	1.52		4.89	
0660	6' high		200	.120		4.27	3.04		7.31	
0720	Add for gate 3' wide, 1-3/8" frame, 3' high		12	2	Ea.	55.50	50.50		106	
	4' high		10	2.400		63	61		124	

600 Series

SPECIALTY SPRINKLERS



Specialty Sprinklers. Complete Coverage.

Toro offers the only truly complete line of sprinklers in the turf industry. Toro 600 Series sprinklers provide specialty products for every application.

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600 SERIES SPECIALTY SPRINKLERS

600 Series Features

- Three standard pressure regulation settings available to ensure consistently accurate nozzle performance, regardless of elevation:
  - 65 PSI*, 80 PSI and 100 PSI (electric and normally closed models)
- Four body styles/activation types available to fit every application: Electric Valve-In-Head, Normally Open Hydraulic Valve-In-Head, Normally Closed Hydraulic Valve-In-Head** and Check-O-Matic
- Manual control at the sprinkler, On-Off-Auto (electric and normally closed models)
- Bowl-vented discharge (atmospheric) minimizes the differential pressure required for regulation and ensures positive valve closure (electric and normally closed)
- Time-proven gear-drive design
- All internal components serviceable from the top of the sprinkler with Servi-Snap™
- Large selection of nozzles available
- Durable engineering plastic and stainless-steel construction

(Except 690 Series)*
*(** Except 650 Series)*

650 Series Specifications

- Radius: 61'-86'
- Flow rate: 16.4-43.7 GPM
- Maximum pressure: 150 PSI
- Trajectory: 25°
- 1½" female-threaded inlet
- Two arc selections:
  - 60°/120° full-circle, two-speed
  - 180°/180° full-circle, two-speed (Two-speed models run at half speed in non-overlap areas to provide balanced water application.)
- Rubber cover kit option: Part No. 650-00 (flat flange), 650-01 (round flange)
- Dimensions:
  - **Pop-up height: 0.75"**
  - **Pop-up height to nozzle: 0.5"**
  - **Body height: 11"**

Specifying Information

65* [X] [X] [XX] [X]

Arc	Body Thread	Valve Type	Nozzle	Pressure Regulation*
6—Full-Circle, 2-Speed (60°/120°) 8—Full-Circle, 2-Speed (180°/180°)	0—NPT 5—BSP	1—Normally Open Hydraulic 2—Check-O-Matic 6—Electric	55 56 57 58 59	6—65 PSI 8—80 PSI 1—100 PSI

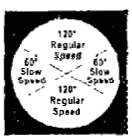
656-06-558

**Electric models only.*

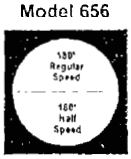
650 SERIES NOZZLE PERFORMANCE — U.S.

BASE PRES	NOZZLE SET 55		NOZZLE SET 56		NOZZLE SET 57		NOZZLE SET 58		NOZZLE SET 59	
PSI	Rad	GPM	Rad	GPM	Rad	GPM	Rad	GPM	Rad	GPM
50	61	16.4	64	17.8	65	22.4	66	24.7	67	28.7
55	62	17.2	65	18.7	67	23.6	68	25.8	71	30.7
60	62	18.0	67	19.6	70	25.1	71	26.9	76	33.7
65	63	18.7	68	20.4	71	26.1	72	28.1	78	34.9
70	64	19.4	69	21.1	72	27.0	75	29.7	80	36.5
75	64	20.0	70	21.9	74	27.9	76	30.5	81	37.5
80	65	20.7	71	22.6	75	28.8	78	31.7	82	38.6
85	66	21.3	72	23.6	76	29.6	79	32.6	83	40.0
90	68	21.9	74	24.5	77	30.6	80	33.5	84	41.7
95	69	22.5	75	25.5	78	31.3	81	34.4	85	42.5
100	70	23.1	76	26.4	79	32.3	82	35.3	86	43.7

Rad = feet GPM = gallons per minute = Pressure regulation = Nozzles not recommended at this pressure



Model 656



Model 658

650 SERIES NOZZLE PERFORMANCE — METRIC

BASE PRESSURE		NOZZLE SET 54			NOZZLE SET 55			NOZZLE SET 56			NOZZLE SET 57			NOZZLE SET 58			NOZZLE SET 59		
kg/cm²	kPa	Rad	l/mn	m³/hr	Rad	l/mn	m³/hr	Rad	l/mn	m³/hr	Rad	l/mn	m³/hr	Rad	l/mn	m³/hr	Rad	l/mn	m³/hr
3.5	3150	17.1	49.2	3.0	18.5	62.1	3.7	19.5	67.4	4.0	19.8	84.8	5.1	20.1	93.5	5.6	20.4	108.6	6.5
4.0	3894	17.1	52.1	3.1	19.0	65.8	3.9	19.9	71.7	4.3	20.5	90.3	5.5	20.8	98.8	6.0	21.9	117.8	7.1
4.5	4436	17.5	55.5	3.3	19.1	70.3	4.2	20.7	77.0	4.7	21.7	98.1	5.9	22.1	105.2	6.3	23.7	132.5	8.0
4.6	4485	17.5	56.0	3.4	19.2	70.8	4.2	20.7	77.2	4.6	21.7	98.6	5.9	22.3	106.4	6.4	23.8	132.1	7.9
5.0	4929	17.7	58.9	3.5	19.6	74.1	4.4	21.1	80.8	4.9	22.1	103.2	6.2	23.0	113.5	6.8	24.6	139.8	8.4
5.5	5372	17.8	61.4	3.7	19.7	77.1	4.6	21.6	84.8	5.1	22.8	107.7	6.4	23.5	117.7	7.0	25.0	145.1	8.7
5.6	5520	18.0	62.1	3.7	19.8	78.3	4.7	21.7	85.5	5.1	22.9	109.0	6.5	23.8	120.0	7.2	25.2	146.9	8.8
6.0	5865	18.3	64.3	3.9	20.1	80.6	4.8	22.0	89.3	5.4	23.2	112.0	6.7	24.1	126.6	7.4	25.3	151.4	9.1
6.5	6407	18.4	67.4	4.1	20.9	83.3	5.1	22.8	94.6	5.7	23.7	117.9	7.1	24.7	129.1	7.7	25.9	161.0	9.7
7.0	6900	18.6	70.4	4.2	21.4	87.4	5.2	23.2	99.9	6.0	24.1	121.3	7.3	25.0	133.6	8.0	26.2	165.4	9.9

kPa = kilo Pascals Rad = meters l/mn = liters per minute m³/hr = cubic meters per hour = Pressure regulation = Nozzles not recommended at this pressure

670 Series Specifications

- Radius 70'-102'
- Flow rate: 31.9-66.8 GPM
- Maximum pressure: 150 PSI
- Trajectory: 25°
- 1½" female-threaded inlet
- Full-circle
- Rubber cover kit option:
  Part No. 670-00 (flat flange),
  670-01 (round flange)
- Dimensions:
  - Pop-up height: 1.25"
  - Pop-up height to nozzle: 1"
  - Body height 11"

Specifying Information

674 [X] [X] [XX] [X]

Body Thread	Valve Type	Nozzle	Pressure Regulation*
0—NPT 5—BSP	1—Normally Open Hydraulic 2—Check-O-Matic 6—Electric 8—Normally Closed Hydraulic	70 71 72 73 74	6—65 PSI 8—80 PSI 1—100 PSI

For Example:
When specifying a 670 Series Sprinkler with NPT threads, #74 nozzle an electric valve and pressure regulation at 80 PSI, you would specify:

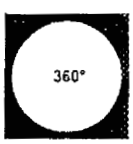
674-06-748

**Electric and normally closed models only*

670 SERIES NOZZLE PERFORMANCE — U.S

BASE PRES	NOZZLE SET 70		NOZZLE SET 71		NOZZLE SET 72		NOZZLE SET 73		NOZZLE SET 74	
PSI	Rad	GPM	Rad	GPM	Rad	GPM	Rad	GPM	Rad	GPM
50	70	31.9	70	34.9	71	38.7	72	41.5	72	44.4
55	73	33.6	73	36.9	75	41.2	76	44.0	77	48.7
60	76	35.5	78	39.5	79	43.7	80	47.8	81	51.0
65	78	36.9	80	41.1	83	46.3	84	51.0	86	37.5
70	80	38.4	82	42.7	85	47.9	86	52.6	89	58.2
75	82	39.7	83	44.1	87	49.4	89	54.5	91	58.9
80	84	41.2	86	45.6	89	51.0	92	55.3	94	59.6
85	85	42.5	88	47.0	91	52.6	94	57.9	96	61.1
90	86	43.8	87	48.5	92	54.5	95	59.8	95	63.1
95	87	45.0	89	49.8	94	55.7	97	61.2	100	65.0
100	88	46.2	90	51.2	95	57.3	98	62.8	102	66.8

Rad = feet GPM = gallons per minute = Pressure regulation = Nozzles not recommended at this pressure



Model 674

670 SERIES NOZZLE PERFORMANCE — METRIC

BASE PRESSURE		NOZZLE SET 70			NOZZLE SET 71			NOZZLE SET 72			NOZZLE SET 73			NOZZLE SET 74		
kg/cm²	kPa	Rad	l/mn	m³/hr	Rad	l/mn	m³/hr	Rad	l/mn	m³/hr	Rad	l/mn	m³/hr	Rad	l/mn	m³/hr
3.5	345.0	21.4	120.7	7.2	21.4	132.3	7.9	21.7	146.5	8.8	22.0	157.1	9.4	22.0	168.1	10.1
4.0	389.4	22.5	128.7	7.7	22.5	141.5	8.5	23.1	157.9	9.5	23.4	171.3	10.2	23.8	186.7	11.2
4.5	443.6	23.7	139.0	8.4	24.3	154.8	9.3	24.7	171.4	10.3	25.1	187.8	11.3	25.5	207.9	12.4
4.8	448.5	23.8	139.7	8.4	24.4	155.6	9.3	25.3	176.2	10.5	25.6	193.0	11.6	26.2	217.6	13.1
5.0	492.9	24.4	145.3	8.7	25.0	161.6	9.7	26.1	181.3	10.9	26.2	199.1	11.9	27.1	220.3	13.2
5.5	537.2	25.0	150.3	9.0	25.3	166.9	10.0	26.5	187.0	11.2	27.1	206.3	12.4	27.8	222.9	13.1
5.8	562.0	25.8	155.9	9.4	26.2	172.6	10.4	27.1	193.9	11.6	28.1	209.3	12.6	28.7	225.6	13.4
6.0	586.5	25.9	160.9	9.7	26.7	177.9	10.7	27.8	199.3	11.9	28.7	219.2	13.2	29.3	232.4	13.9
6.5	610.7	26.2	165.8	9.9	27.4	183.6	11.0	28.1	206.3	12.1	29.0	226.3	13.6	30.2	240.0	14.4
7.0	600.0	26.8	174.9	10.5	27.7	193.8	11.6	29.0	216.9	13.0	29.9	236.7	14.3	31.1	252.8	15.2

kPa = kilo Pascals Rad = meters l/mn = liters per minute m³/hr = cubic meters per hour
= Pressure regulation models = Nozzles not recommended at this pressure

600 SERIES SPECIALTY SPRINKLERS

30 YEARS GENUINE TORO GEAR DRIVES EXPERIENCE

690 Series Specifications

- Radius 73'-108'
- Flow rate: 40.5-82.2 GPM
- Maximum pressure: 150 PSI
- Trajectory: 25°
- 1½" female-threaded inlet
- Nine arc selections:
  - 90°, 150°, 165°, 180°, 195°, 210° 360° fixed arcs
  - 60°/120° full-circle, two-speed
  - 180°/180° full-circle, two-speed (Two-speed models run at half speed in non-overlap areas to provide balanced water application.)
- Rubber cover kit option. Part No. 690-01
- Dimensions:
  - Pop-up height: 1"
  - Pop-up height to nozzle: 0.5"
  - Body height: 16"

Specifying Information

69[ ] [0X] [XX] [X]

Arc		Valve Type	Nozzle	Pressure Regulation*
1—90°	A—150°	1—Normally Open Hydraulic	90	8—80 PSI
2—180°	B—165°	2—Check-O-Matic	91	1—100 PSI
4—Full-Circle	C—195°	6—Electric	92	
6—Full-Circle, 2-Speed (60°/120°)	D—210°	8—Normally Closed Hydraulic		
8—Full-Circle 2-Speed (180°/180°)				

For Example
When specifying a 690 Series Sprinkler with a 180° arc, an electric valve, #91 nozzle and pressure regulation at 80 PSI, you would specify:

692-06-918

*Electric and normally closed models only

690 SERIES NOZZLE PERFORMANCE — U.S.

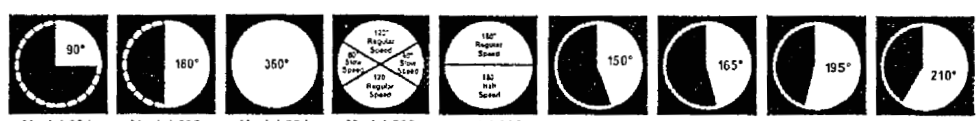
BASE PRES	NOZZLE SET 90		NOZZLE SET 91		NOZZLE SET 92	
PSI	Rad	GPM	Rad	GPM	Rad	GPM
50	73	40.5	84	50.7	88	62.5
55	75	42.8	86	52.2	90	63.0
60	78	45.1	87	53.7	92	63.6
65	80	47.4	89	56.3	94	64.2
70	82	48.6	91	57.2	96	67.5
75	85	49.8	93	59.2	98	70.7
80	87	51.3	96	61.2	100	74.0
85	88	52.5	97	64.3	102	76.1
90	89	54.1	98	67.3	105	78.0
95	89	55.6	99	70.4	106	80.2
100	90	57.1	100	73.4	108	82.2

Rad = feet GPM = gallons per minute
- = Pressure regulation models
= Nozzles not recommended at this pressure

690 SERIES NOZZLE PERFORMANCE — METRIC

BASE PRESSURE		NOZZLE SET 90			NOZZLE SET 91			NOZZLE SET 92		
kg/cm²	kPa	Rad	l/min	m³/hr	Rad	l/mn	m³/hr	Rad	l/mn	m³/hr
3.5	345.0	22.3	153.3	9.2	25.6	191.9	11.5	26.8	235.8	14.2
4.0	389.4	23.0	163.8	9.8	26.3	200.1	12.0	27.7	240.7	14.4
4.5	443.6	24.2	176.1	10.5	26.9	210.7	12.6	28.6	247.2	14.8
4.5	448.5	24.4	179.4	10.6	27.2	213.1	12.8	28.7	243.4	14.6
5.0	492.9	25.1	185.8	11.1	27.9	219.0	13.1	29.5	257.7	15.4
5.5	537.2	26.2	192.1	11.5	29.0	229.0	13.7	30.2	271.9	16.4
5.6	552.0	26.5	193.0	11.6	29.3	231.6	13.9	30.5	280.1	16.8
6.0	586.5	26.8	198.7	11.9	29.6	213.1	14.6	31.1	288.0	17.3
6.5	640.7	27.5	208.4	12.5	30.2	259.6	15.6	32.3	299.5	18.0
7.0	690.0	27.5	216.1	13.0	30.5	277.8	16.7	32.8	311.1	18.7

kPa = kilo Pascals Rad = meters
l/mn = liters per minute m³/hr = cubic meters per hour
- = Pressure regulation models
= Nozzles not recommended at this pressure



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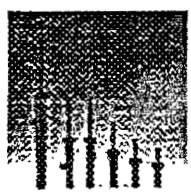
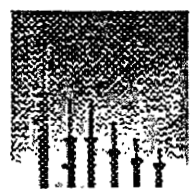


Toro 570 'Z' Series Sprinkler Model 570Z-3P
1.94 / ea

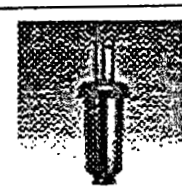


Toro 570 'Z' Series Sprinkler Model 570Z-12P
8 01 / ea

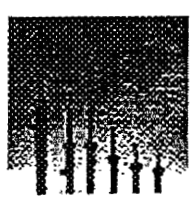
Toro 570 'Z' Series Spri 570Z-4P
2.00 / ea

Toro 570 'Z' Series Sprinkler Model 570Z-6P
6.86 / ea

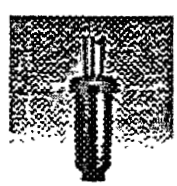
Toro Super 600 Sprinklers Height: 6-1/4 in. Model S600PC2 5
13 37 / ea



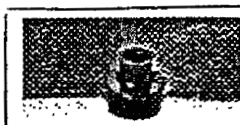
Toro Super 600 Sprinkle in. Model S600FC2 5
13 37 / ea



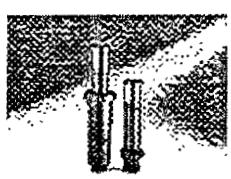
Toro 570 'Z' Series Sprinkler Model 570Z-2P
2.80 / ea



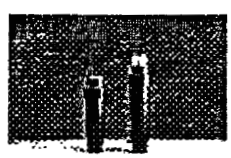
Toro Super 600 Sprinklers Height 6-1/4 in. Model S600PC1 3
13 37 / ea



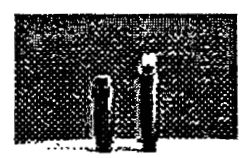
Toro 570 Series Sprinkl Model 570S
0 71 / ea



Toro V-1550 Sprinklers Model V-1550-4L
14 59 / ea



Toro 640 Series Sprinklers Body Height: 9 in. Model 644-02-41
74 93 / ea



Toro 640 Series Sprinkl 9 in. Model 642-02-41
97 11 / ea

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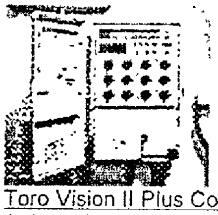
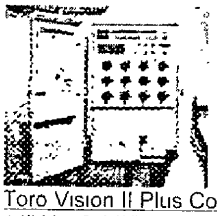
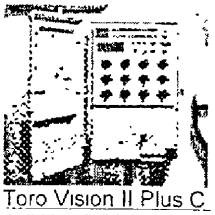


Toro Vision II Plus Controller Plastic 14" H x 9-3/8" W x 3-1/4" D Model V2-P12E
299.14 / ea



Toro Vision II Plus Controller Plastic 14" H x 9-3/8" W x 3-1/4" D Model V2-P09E
209 66 / ea



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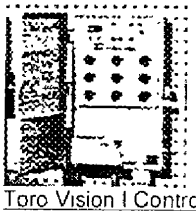
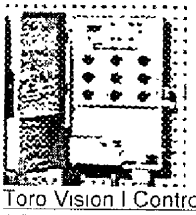
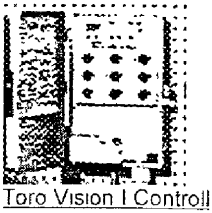


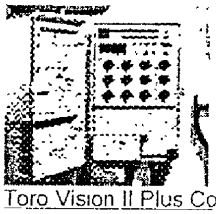
Toro Vision I Controller 12-15/16" H x 8-7/8" W x 3-1/4" D Model 188-06-12
228 75 / ea



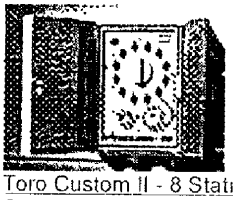
Toro Vision I Controller 12-15/16" H x 8-7/8" W x 3-1/4" D Model 188-66-12
135 00 / ea



Toro Vision I Controll 8-7/8" W x 3-1/4" D.
171.00 / ea



Toro Vision II Plus Controller Plastic 14" H x 9-3/8" W x 3-1/4" D Model V2-P06E
165 30 / ea



Toro Custom II - 8 Station, Wall Mount Controller 11" H x 9" W x 6-1/2" D Model 133-01-02
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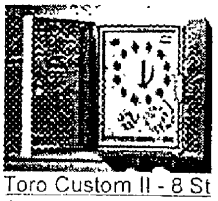

Toro Custom II - 8 St Controller 11" H x 9" Model 133-01-12
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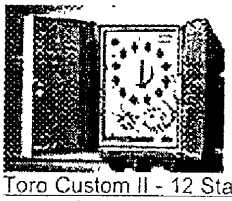
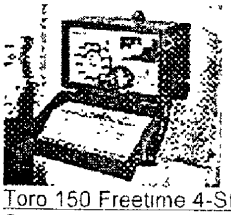
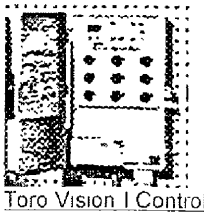


Toro Custom II - 12 Station, Wall Mount Controller 11" H x 9" W x 6-1/2" D Model 137-01-12
CALL



Toro 150 Freetime 4-Station Hydraulic Controller 7" H x 4-1/2" W x 4-3/4" D Model 150-00-14
150 00 / ea



Toro Vision I Controll 8-7/8" W x 3-1/4" D.
135 00 / EA

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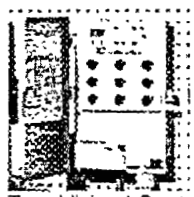
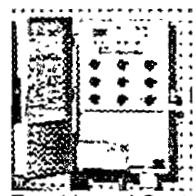
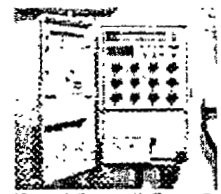
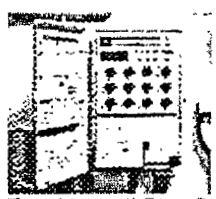
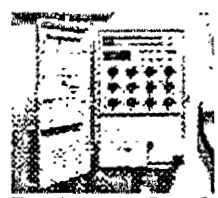
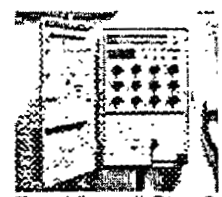

Toro Vision I Controller 12-15/16" H x 8-7/8" W x 3-1/4" D Model 188-96-02
CALL

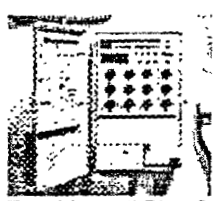

Toro Vision I Controller 12-15/16" H x 8-7/8" W x 3-1/4" D Model 188-06-02
109 96 / EA


Toro Vision II Plus C 14" H x 9-3/8" W x 3-
V2-M06
247 50 / EA


Toro Vision II Plus Controller Plastic 14" H x 9-3/8" W x 3-1/4" D Model V2-M09
CALL


Toro Vision II Plus Controller Plastic 14" H x 9-3/8" W x 3-1/4" D Model V2-M12
363 00 / ea


Toro Vision II Plus C 14" H x 9-3/8" W x 3-
V2-P06
CALL


Toro Vision II Plus Controller Plastic 14" H x 9-3/8" W x 3-1/4" D Model V2-P12
243.75 / ea

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In Stock and Standard Vertical Water Storage Tanks

(Some tanks can be used other then water -, please call me.)

Since 1932

125 psi (862 kPa) @ 200 F (93 C) A.S.M.E. Code

These are some of the hydropneumatic tank models only, please call for other sizes.

Ask for **Steve** (Special tank or volume buyer? Please call.):

1-800-421-9395 ext. 232

Fax: 1-213-747-7724

Cell(24/7): 1-213-798-0903

or

E-mail here: tank@asmepressurevessels.com

or print and fax this Order Form

- Glass "G" lined or "W" special with 11"x 15" (28x38 cm) manway or 4" x 6"(10x15 cm) hand hole
- Most of them designed for 96" (244 cm) ceilings
- 2-1/2" connections

$ 2828
1131 + 40% Install
$ 3959

Please click on the Part# to see and print out drawing.

For future reference, please BOOKMARK this page.

All ASME Section VIII, Division I, with "U" stamp. Metric/English Connections per drawings

GAL.	SIZE	WEIGHT	SQ.FT.	PART #	DELIVERY	NET PRICE	FOAM** INSULATION
80	24 X 47	260	27	WI-770-B	4-5 weeks	$ 1682.00	$ 326.00
140	30 X 51	416	37	GS-30-140-V	4-5 weeks	$ 2360.00	$ 435.00
180	30 X 63	486	45	GS-30-180-V	4-5 weeks	$ 2479.00	$ 503.00
235	30 X 84	569	58	GS-30-235-V	STOCK	$ 2,668.00	$ 613.00
305	36 X 77	642	66	GS-36-305-V	STOCK	$2828.00	$ 705.00
335	36 X 84	684	71	GS-36-335-V	STOCK	$ 3007.00	$ 748.00
360	36 X 88	712	75	GS-36-360-V	4-5 week	$ 3110.00	$ 782.00
400	36 X 99	789	83	GS-36-400-V	4-5 week	$ 3217.00	$ 850.00

460	36 X 113	948	94	GS-36-460-V	4-5 week	$ 3654 00	$ 943 00
462	**42 X 84**	**904**	**84**	GS-42-462-V	**STOCK**	**$ 3550.00**	**$ 882.00**
534	**42 X 96**	**1014**	**95**	GS-42-534-V	**STOCK**	**$ 3820.00**	**$ 976.00**
650	42 X 118	1263	117	GS-42-650-V	4-5 week	$ 4292 00	$ 1163.00
585	**48 X 84**	**1144**	**95**	GS-48-585-V	**STOCK**	**$ 4403.00**	**$ 1000.00**
800	48 X 113	1336	125	GS-48-800-V	4-5 weeks	$ 5172 00	$ 1255 00
870	48 X 122	1441	134	GS-48-870-V	4-5 weeks	$ 5355 00	$ 1331.00
1040	54 X 115	1771	144	GS-54-1040-V	4-5 weeks	$ 6121 00	$ 1440 00
1240	56 X 127	1974	166	GS-56-1240-V	4-5 weeks	$ 7544 00	$ 1635 00
1400	60 X 129	2120	179	GS-60-1400-V	4-5 weeks	$ 7986.00	$ 1762 00
1500	64 X 121	2406	185	GS-64-1500-V	4-5 weeks	$ 8385 00	$ 1829 00
3000	66 X 216	3956	326	WI-472-B	4-5 weeks	$ 10274 00	$ 3035.00
1600	72 X 105	2372	183	GS-72-1600-V	4-5 weeks	$ 9358 00	$ 1844 00
2100	72 X 135	2763	230	GS-72-2100-V	4-5 weeks	$10409 00	$ 2243.00
2854	72 X 180	3768	302	WI-703-B	4-5 weeks	$10909 00	$ 2855.00

more *See Custom Water Tanks if this page does not show what you need.*

Notes:

- *All prices are plus freight*
- *We will deliver any of the "STOCK" tanks in Michigan, Ohio, Kentucky, Tennessee, Alabama and points west for an extra $200.00. Hawaii and Alaska are excluded from this freight offer.*
- *The listed tanks not only for water some of them can be used as a air tank, aqueous ammonia tank, oxygen tank, helium tank, natural gas tank, nitrogen tank, pressured oil tank, hydraulic oil tank, acid tank, special chemical storage tank etc. ... Please let me know if you have a interesting application I will add to this list.*
- *In stock tanks are shown with bigger font and bold.*
- *These welded storage tanks above and our custom tanks often used as a home pressure tank or potable water storage tank connected to a well and referred also as well water pressure tank or well water storage tanks. These pressurized water tanks can be connected with solar panels and used as solar hot water storage tank also.*
- *Hydro pneumatic or hot water tanks frequently equipped with bladder or bag and called hydro pneumatic bladder or bag tanks or diaphragm tanks. Please call me or e-mail me if you need this kind of hydro pneumatic tank.*

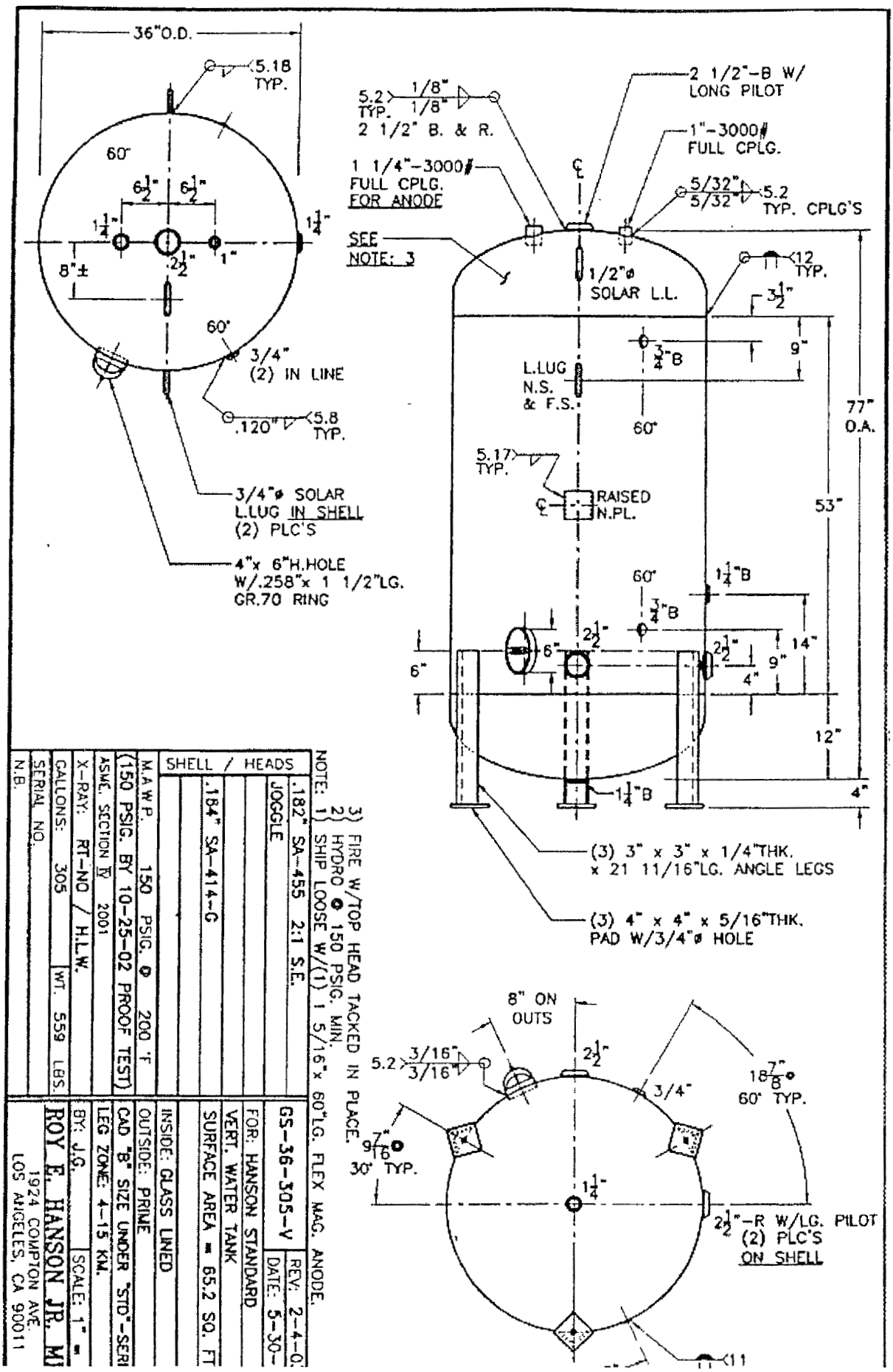
** Includes *shipping skid*

These are some of the hot water tank models only, please call for other sizes.

Ask for Steve (Special tank or volume buyer? Please call.):

1-800-421-9395 ext. 232

Fax: 1-213-747-7724



SHELL / HEADS	
M.A.W.P. 150 PSIG. @ 200 °F	
(150 PSIG. BY 10-25-02 PROOF TEST)	
ASME, SECTION IV 2001	
X-RAY: RT-NO / H.L.W.	
GALLONS: 305 WT. 559 LBS.	
SERIAL NO.	
N.B.	
.182" SA-455 2:1 S.E. JOGGLE	
.184" SA-414-G	
INSIDE: GLASS LINED	
OUTSIDE: PRIME	
CAD "B" SIZE UNDER "STD"-SERI	
LEG ZONE: 4-15 KM.	
BY: J.G. SCALE: 1" =	
ROY E. HANSON JR. MI	
1924 COMPTON AVE. LOS ANGELES, CA 90011	
GS-36-305-V	REV: 2-4-0
FOR: HANSON STANDARD	DATE: 5-30-
VERT. WATER TANK	
SURFACE AREA = 65.2 SQ. FT	

NOTE: 1) SHIP LOOSE W/(1) 1 5/16"x 60"LG. FLEX MAG. ANODE.
2) HYDRO @ 150 PSIG. MIN.
3) FIRE W/TOP HEAD TACKED IN PLACE.

Frank Seidman

From: "Frank Seidman" <FRANKDEN@nettally com>
To: "David L. Orr" <d.l.orr@utilitiesinc-usa.com>
Sent: Thursday, March 06, 2003 8:30 AM
Subject: Fw: Alafaya

Forgot one:

MW-1, 3059A15208	6947	10.16	Shallow	Compliance

----- Original Message -----
From: Frank Seidman
To: David L. Orr
Sent: Thursday, March 06, 2003 8:27 AM
Subject: Alafaya

According to your permits, the following are the monitoring wells at the golf course:

Site no.	WAFR no.	Depth(ft)	Aquifer	Type
MW-2, 3059A15209	6946	9 95	Shallow	Background
MW-3, 3059A15210	6945	12.0	Shallow	Compliance
MW-4, 3059A15211	6944	12.8	Shallow	Compliance
MW-5, 3059A15212	6943	11.21	Shallow	Compliance
MW-6, 3059A14272	6942	15.3	Shallow	Compliance

Can you price these out at today's cost?

Frank Seidman

From: "David L. Orr" <d l orr@utilitiesinc-usa.com>
To: "Frank Siedman" <frankden@nettally.com>
Sent: Monday, March 17, 2003 6:03 PM
Subject: Monitoring wells

Frank -

Below is a re-print of the e-mail I had received from Scotty regarding your question. Please let me know if you require additional information.

Thanks -

David,
I had spoken to Todd Fullerton of Groundwater Protection Inc. He stated that the cost to install a single monitoring well in the Orlando Area is $950.00. He said that he keeps in mind how many wells are being installed, and where they have to be located when doing cost estimates. -Scotty-

PURCHASE ORDER | No 89495

DATE February 1, 1989 | AUTHORIZED BY.

PURCHASER.
ALAFAYA UTILITIES
1404 EL CAJON CT.
WINTER SPRINGS, FL 32708

CONTRACTOR.
Fore Golf
316 N. Bermuda Ave.
Suite 5
Kissimmee, FL 32741

Subdivision.
~~Twin~~ Rivers Golf Course / effluent Disposal Job # 894

Lots Or # Of Units Affected:

Cost Per Unit Of Change:

SUBJECT OF CHANGE

TWIN RIVERS GOLF COURSE

PARTIAL NECESSARY WORK TO DATE TO COMPLETE WET WEATHER HOLDING POND. TO HOLD THE EFFLUENT DISPOSAL FROM PLANT. $ 96,176.40

FILL MATERIAL NECESSARY TO CREATE THE EFFLUENT DISPOSAL CONDITION ON THE GOLF COURSE FOR THE PLANT TO FUNCTION PER THE SINGHOFEN.AND ASSOCIATES OPINION OF COST DATED 12-19-88
49,230CY @1.30 63,999.00

$160,175.40

Job # 894

NOT RESPONSIBLE FOR MATERIAL DELIVERED WITHOUT AN AUTHORIZED PURCHASE ORDER

PURCHASER	SUPPLIER	TOTAL
AUTHORIZED SIGNATURE	WE HAVE READ AND APPROVED ALL TERMS AND CONDITIONS OF PURCHASE AS NOTED ON THIS PURCHASE ORDER. AUTHORIZED SIGNATURE	$160,175.40 PROJECT #
TYPED NAME AND TITLE	TYPED NAME AND TITLE	COST CODE
2-2-89 DATE	DATE	☐ ON-SITE ☐ OFF-SITE

PAYMENT REQUESTS RECEIVED BY THE PURCHASER ON OR BEFORE THE 15th OF THE MONTH WILL BE PAID BY THE LAST DAY OF THE SAME MONTH. APPLICABLE DISCOUNTS WILL BE TAKEN WHEN PAYMENT IS MADE ON OR BEFORE THE LAST DAY OF THE MONTH. PLEASE REFER TO P.O. NUMBER ON ANY CORRESPONDENCE OR PAYMENT REQUESTS

PURCHASE ORDER

No. 69552

DATE March 9, 1989

AUTHORIZED BY

PURCHASER

ALAFAYA UTILITIES, INC.
1404 EL CAJON CT.
WINTER SPRINGS, FL 32708

CONTRACTOR

Fore Golf
316 N. Bermuda Ave.
Suite 5
Kissimmee, FL 32741

Subdivision:
Twin Rivers Golf Course

Lots Or # Of Units Affected

Cost Per Unit Of Change:

SUBJECT OF CHANGE

PER THE SINGHOFEN & ASSOCIATES, INC. COST ESTIMATE FOR AFFLUENT DISPOSAL RE: THE EXPANSION OF THE ALAFAYA UTILITIES PLANT. THE FOLLOWING ITEMS HAVE BEEN ALOCATED FROM THE GOLF COURSE CONTRACT AND PAID FOR BY ALAFAYA UTILITIES TO DISPOSE OF AFFLUENT.

EARTHWORK	$ 80,001.00
WET WEATHER POND	24,044.10
IRRIGATION	24,500.00
	$128,545.10

NOT RESPONSIBLE FOR MATERIAL DELIVERED WITHOUT AN AUTHORIZED PURCHASE ORDER

PURCHASER	SUPPLIER	TOTAL
AUTHORIZED SIGNATURE	WE HAVE READ AND APPROVED ALL TERMS AND CONDITIONS OF PURCHASE AS NOTED ON THIS PURCHASE ORDER AUTHORIZED SIGNATURE	$128,545.10 PROJECT #
TYPED NAME AND TITLE	TYPED NAME AND TITLE	COST CODE ☐ ON-SITE ☐ OFF-SITE
DATE	DATE	

PAYMENT REQUESTS RECEIVED BY THE PURCHASER ON OR BEFORE THE 15th OF THE MONTH WILL BE PAID BY THE LAST DAY OF THE SAME MONTH. APPLICABLE DISCOUNTS WILL BE TAKEN WHEN PAYMENT IS MADE ON OR BEFORE THE LAST DAY OF THE MONTH. PLEASE REFER TO P.O. NUMBER ON ANY CORRESPONDENCE OR PAYMENT REQUESTS

BULLETIN NO. 157

1912 to January 1, 2003

THE

HANDY-WHITMAN INDEX®

of

Public Utility Construction Costs™

TRENDS OF CONSTRUCTION COSTS

Preliminaries

Compiled and Published by

WHITMAN, REQUARDT AND ASSOCIATES, LLP
Engineers-Consultants
801 South Caroline Street
Baltimore, Maryland 21231
410-235-3450

HANDY-WHITMAN INDEX OF PUBLIC UTILITY CONSTRUCTION COSTS

PRELIMINARY NUMBERS BULLETIN 157

BUILDING INDEXES 1/1/03

NE	REGION 1	REGION 2	REGION 3	REGION 4	REGION 5	REGION 6
2	364	291	356	301	317	361
3	385	317	385	332	367	380
4	375	341	364	337	344	358
5	367	278	360	289	301	369
6	322	246	330	259	278	342
9	355	349	368	386	385	363
0	149	177	209	211	222	242
1	220	219	219	220	215	225
12	426	547	504	527	746	409
3	383	326	375	435	318	343
6	419	298	392	299	315	409
17	406	284	387	289	295	398
18	402	276	385	274	294	398
9	403	258	388	273	292	406
20	449	329	429	321	337	455
21	425	330	393	330	358	422
2	434	311	381	328	357	429

HANDY-WHITMAN INDEX OF PUBLIC UTILITY CONSTRUCTION COSTS

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MATERIAL INDEXES 1/1/03

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6	255
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9	396
10	543
11	223
12	252
13	508
14	420
15	222
16	293
17	328
18	566
19	96
20	402
21	462
22	384
23	239
24	260
25	291
26	387
28	495
29	256
30	423
31	305
32	181
33	317
35	299
36	510
37	292
38	561
39	612
40	691
41	726
42	353
43	387
44	970
45	207
50	398

UTILITY CONSTRUCTION COSTS

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REGION 1	REGION 2	REGION 3	REGION 4	REGION 5	REGION 6
344	[illegible]	348	311	324	344
390	[illegible]	407	331	365	394
515	535	535	535	535	535
390	325	387	331	365	394
448	386	430	396	405	446
456	378	440	408	417	453
275	275	275	275	275	275
429	429	425	429	429	429
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404	356	398	386	370	408
420	378	448	405	391	424
407	340	378	342	345	381
436	359	394	360	363	391
450	357	402	352	364	382
364	305	351	313	315	368
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363	286	359	294	299	378
207	207	207	207	207	207
436	340	413	351	364	414
569	428	551	539	541	574
687	643	685	657	663	700
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405	325	374	328	347	395

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USDA NRIAI
The Natural Resources Inventory & Analysis Institute

NRCS Economics & Analysis Site

Economic and Watershed Technical Information

NRCS Discount Rates and Price Indexes

Construction Cost Index History (1908-2001)

from: http://www.enr.com/cost/costcci.asp

HOW ENR BUILDS THE INDEX: 200 hours of common labor at the 20-city average of common labor rates, plus 25 cwt of standard structural steel shapes at the mill price prior to 1996 and the fabricated 20-city price from 1996, plus 1.128 tons of portland cement at the 20-city price, plus 1,088 board-ft of 2 x 4 lumber at the 20-city price.

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL AVG
1977	2494	2505	2513	2514	2515	2541	2579	2611	2644	2675	2659	2660	2576
1978	2672	2681	2693	2698	2733	2753	2821	2829	2851	2851	2861	2869	2776
1979	2872	2877	2886	2886	2889	2984	3052	3071	3120	3122	3131	3140	3003
1980	3132	3134	3159	3143	3139	3198	3260	3304	3319	3327	3355	3376	3237
1981	3372	3373	3384	3450	3471	3496	3548	3616	3657	3660	3697	3695	3535
1982	3704	3728	3721	3731	3734	3815	3899	3899	3902	3901	3917	3950	3825
1983	3960	4001	4006	4001	4003	4073	4108	4132	4142	4127	4133	4110	4066
1984	4109	4113	4118	4132	4142	4161	4166	4169	4176	4161	4158	4144	4146
1985	4145	4153	4151	4150	4171	4201	4220	4230	4229	4228	4231	4228	4195
1986	4218	4230	4231	4242	4275	4303	4332	4334	4335	4344	4342	4351	4295

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL AVG
1987	4354	4352	4359	4363	4369	4387	4404	4443	4456	4459	4453	4478	4406
1988	4470	4473	4484	4489	4493	4525	4532	4542	4535	4555	4567	4568	4519
1989	4580	4573	4574	4577	4578	4599	4608	4618	4658	4658	4668	4685	4615
1990	4680	4685	4691	4693	4707	4732	4734	4752	4774	4771	4787	4777	4732

1991	4777	4773	4772	4766	4801	4818	4854	4892	4891	4892	4896	4889	4835
1992	4888	4884	4927	4946	4965	4973	4992	5032	5042	5052	5058	5059	4985
1993	5071	5070	5106	5167	5262	5260	5252	5230	5255	5264	5278	5310	5210
1994	5336	5371	5381	5405	5405	5408	5409	5424	5437	5437	5439	5439	5408
1995	5443	5444	5435	5432	5433	5432	5484	5506	5491	5511	5519	5524	5471
1996	5523	5532	5537	5550	5572	5597	5617	5652	5683	5719	5740	5744	5620
1997	5765	5769	5759	5799	5837	5860	5863	5854	5851	5848	5838	5858	5825
1998	5852	5874	5875	5883	5881	5895	5921	5929	5963	5986	5995	5991	5920
1999	6000	5992	5986	6008	6006	6039	6076	6091	6128	6134	6127	6127	6060
2000	6130	6160	6202	6201	6233	6238	6225	6233	6224	6259	6266	6283	6222
2001	6281	6273	6280	6286	6288	6319	6404	6389	6391	6397			

Base: 1913=100. Indexes revised for March, April and May 2000

2003 EXTRAPOLATED 6597

ANNUAL AVERAGE					
1908	97	1931	181	1954	628
1909	91	1932	157	1955	660
1910	96	1933	170	1956	692
1911	93	1934	198	1957	724
1912	91	1935	196	1958	759
1913	100	1936	206	1959	797
1914	89	1937	235	1960	824
1915	93	1938	236	1961	847
1916	130	1939	236	1962	872
1917	181	1940	242	1963	901
1918	189	1941	258	1964	936
1919	198	1942	276	1965	971
1920	251	1943	290	1966	1019
1921	202	1944	299	1967	1074
1922	174	1945	308	1968	1155
1923	214	1946	346	1969	1269
1924	215	1947	413	1970	1381
1925	207	1948	461	1971	1581
1926	208	1949	477	1972	1753
1927	206	1950	510	1973	1895
1928	207	1951	543	1974	2020
1929	207	1952	569	1975	2212
1930	203	1953	600	1976	2401

Appendix B

APPENDIX B

Milian Swain and Associates
Workpapers and Supporting Documentation

MSA Milian, Swain and Associates
2035 S.W. 32nd Avenue, Miami, Florida 33145
Tel. (305) 441-0123 Fax (305) 441-0688

CIVIL ENGINEERING • ENVIRONMENTAL ENGINEERING • UTILITY MANAGEMENT • FINANCIAL CONSULTING

FAX TRANSMITTAL

File: Proposal

Date: March 31, 2003

To: **Frank Seidman**

Of: **Management & Regulatory Consultants, Inc.**

Fax #: (850) 877-0673

From: Mr. Robert Regalado and Mr. Jorge Garcia

cc: Arsenio Milian and Deborah Swain

Re: **Alafaya Rivers Utilities, Inc. – Twin Rivers Disposal Facility**

Pages: 37 (Including Cover Sheet)

Dear Mr. Seidman:

According to our phone conversation this afternoon, we revised the cost estimate of the replacement of the Wet Weather Holding Pond and the Irrigation Pump Station, which we sent to you yesterday. However, the Cost Estimate was done based on the following information:

a) Drawings done by Commonwealth Engineering Associates, Inc. on July 1987 (Sheet from 13 of 18 to 18 of 18)
b) Invoice of works done on that place on 08/25/85. (Contractor: Aries Construction, Inc.)
c) RSMeans-Heavy Construction Cost Data-2002
d) NRCS Discount Rates and Price Indexes (E.N.R. Indexes).
e) Quotation of RC Beach & Associates, Inc. for the pumps.
f) Quotation of Precast 4 US Corporation

The new cost estimate is:

*	The Wet Weather Holding Pond	$ 237,900.00 (See page 19/37)
*	The Irrigation Pump Station	$ 188,200.00 (See page 20/37)

Attached you can find the pages (back-up) revised and we'll appreciate you revise them and if you are agree with such information, please let us know. However, we will overnight the entire package.

If you have any question, please feel free to call us. Thank you.

MILIAN, SWAIN & ASSOCIATES, INC.

Robert Regalado
Manager of Engineering

03/17/03

ALAFAYA UTILITIES, INC.-

Cost estimate for: (Just install)

1.- The Wet Weather Holding Pond (Sheets 13-14)
2.- The Irrigation Pump Station. (Sheet 15)

Other installations: (Not shown on the prints)

a) 12'x12' Pump House with 2-75 HP and 1-25 HP service pumps.
b) An approx. 500 gals. tank.
c) a Cla-Val and control panels

1.- The Wet Weather Holding Pond (Sheets 13-14)

- Take-off:
  - Holding Pond
  - Underdrain Sump with Pumps.

I.- Holding Pond:

a) Excavation: (From South to North)

Volume ①: Height on lowest point: 38.3'-30.5'+2' = 9.8'
" " highest " : 1'
" " middle " : 38.5'-35.25'+2' = 5.25'

Volume ① = $9.8' \times \left(\frac{40'}{3}\right) \times 313' + 5.25' \times \left(\frac{40'}{3}\right) \times 313' + 1' \times \left(\frac{40'}{3}\right) \times 313'$

Volume ① = 65,730 c.f. = 2,434.44 c.y.
(Bet. 39'&40')

Volume ②: Aver. height = 37.5' - 30.5' + 2' = 9'
(Bet 38'&39') Volume = 9' x 305' x 40' = 109,800 c.f = 4,066.67 c.y.

Volume ③: Aver. height = 36.5' - 30.5' + 2 = 8'
(Bet. 37'&36') Volume = 8' x 310' x 30' = 74,400 c.f = 2,755.55 c.y.

Volume ④: Aver height = 35.5' - 30.5' + 2' = 7'
(Bet. 35'&36') Volume = 7' x 340' x 50' = 119,000 c.f. = 4,407.41 c.y.

Volume ⑤: Aver height = 34.5' - 30.5' + 2' = 6'
(Bet. 34'&35') Volume = 6' x 180' x 40' + 6' x 330' x 150' = 340,200 c.f.
= 12,600 c.y.

Volume ⑥: Aver height = 33.5' - 30.5' + 2' = 5'
(Bet. 33'&34') Volume = 5' x 160' x 60' + 5' x 250' x 50' = 110,500 c.f
= 4,092.59 c.y.

Volume ⑦: Aver height = 32.5' - 30.5' + 2' = 4'
(Bet. 32'&33') Volume = 4' x 100' x 75' + 4' x 152' x 40' = 54,320 c.f.
= 2,011.85 c.y.

Volume ⑧: Aver height = 31.5' - 30.5' + 2' = 3'
(Bet. 31'&32') Volume = 3' x 120' x 40' = 14,400 c.f. = 533.3 c y.

Total Volume = 32,901.84 c.y ≈ 33,000 c.y.

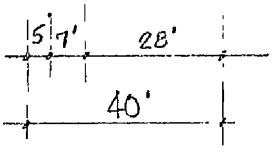
Total volume = 33,000 c y

b) Fill material : (As per Sheet 13 of 18)

- Compacted fill : 48' x 3' x 313' = 45,072 c.f. = 1,669.33 c.y.

- South Side : Clay Liner = 30' x 1' x 313' = 9,390 c.f. = 348 c.y

Area = 48' x 313' = 15,024 s.f. = 1,669.33 s.y.

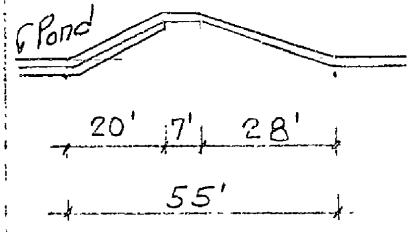


- East Side : C.F = 55' x 3' x 390' = 64,350 c.f. = 2,383 c.y.

Clay Liner = 23' x 1' x 390' = 8,970 c.f.

= 332 c.y

Area = 55' x 390' = 21,450 s.f. = 2,383.33 s.y

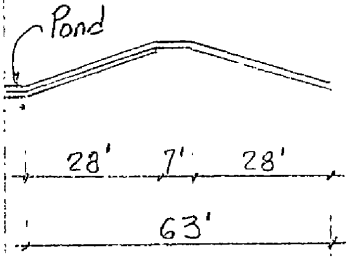


- West Side :

Comp. fill = 63' x 415' x 3' = 78,435 c.f. = 2,905 c.y

Clay Liner = 28' x 415' x 1' = 11,620 c.f. = 430 c.y.

Area = 63' x 415' = 26,145 s.f. = 2,905 c.y.

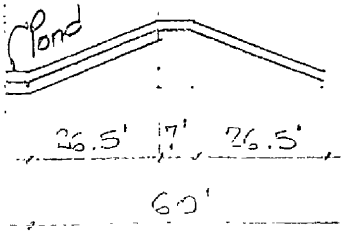


North Side :

Comp. fill = 60' x 320' x 3' = 57,600 c.f. = 2,133 c.y.

Clay liner = 26.5' x 320' x 1' = 8,480 c.f. = 314 c.y.

Area = 60' x 320' = 19,200 s.f. = 2,133.33 s.y



Bottom of Wet Weather Holding Pond : (As per Sheet 13 of 18)

$$\text{Area} = \frac{18' \times 25'}{2} + 15' \times 20' + \frac{26' \times 10'}{2} + \frac{15' \times 6'}{2} + \frac{(17'+4') \times 60'}{2}$$

$$+ \frac{40' \times 4'}{2} + 182.50' \times 320' + 55' \times \frac{(173'+87')}{2}$$

$$+ \frac{21' \times 37'}{2} + \frac{(25'+37') \times 69'}{2} = 69,412.50 \text{ s.f.} = 7,712.50 \text{ s.y}$$

Compacted fill volume = 69,412.50 s.f. × 3' = 208,237.50 c.f
= 7,712.50 c.y

Clay liner volume = 69,412.50 s.f × 1' = 69,412.50 c.f.
= 2,570.83 c.y

Fill material total volume :

Compacted fill = 1,669.33 + 2,383 + 2,905 + 2,153
+ 7,712.50 =
= 16,802.83 c.y.

Clay liner = 348 + 332 + 430 + 314 + 2,570.83.
= 3,994.83 c.y.

Total Compacted Fill : 16,802.83 c.y

Total Clay Liner : 3,994.83 c.y

b.1.- Other fill material : Fine Sand Layer

On Slopes: South Side : 48' x 313' = 15,024.00 s.f.
East Side : 55' x 390' = 21,450.00 s.f.
West Side : 63' x 415' = 26,145.00 s.f.
North Side : 60' x 320' = 19,200.00 s.f.
On Bottom : = 69,412.50 s.f.
Total = 151,231.50 s.f.

Volume = 151,231.50 s.f. x 1' = 151,231.50 c.f. = 5,601 c.y.

Fine Sand Layer Volume = 5,601 c.y. (This material was considered in the compacted fill)

II.- Irrigation Pump Station.- (As per Sheet 15 of 18)

a) Excavation :

Data: Length = 6' + 2.67' + 4' (Clearance on the walls) = 12.67
Width = 8.27' (Assumed)
Deep = 40' (Finish grade elev.) - 23' (Bottom elev.)
+ 0.75' (Bottom slab thickness) + 2' = 19.75

Floor exc. = 4.77' x 16.96' + 9.27' x 4.77' = 125.12 s.f.

Exc. = 12.67' x 8.27' x 19.75' + 125.12 x 0.67'
= 2,069.42 + 83.83 = 2,153.25 c.f. = 79.75 c.y.

Exc. Volume = 80 c.y.

b) Concrete :

- Floor Slab : $(3' + 7.33'+12') \times 0.67' \times 4.27 + 12' \times 0.67' \times 4.27'$
  $= 98.21$ c.f. $= 3.64$ c.y.

- Walls : $7.33' \times 0.67' \times (40-23) \times 2 + 5.6' \times 0.67' \times (40-23) \times 2$
  $= 294.55$ c.f $= 10.91$ c.y.

- Bottom Slab $= 7.33' \times 5.60' \times 0.75' = 30.79$ c.f.
  $= 1.14$ c.y.

Total concrete $= 3.64 + 10.91 + 1.14 = 15.69$ c.y.

Concrete volume = 16 c.y.

c) Compacted fill :

Volume = Excavation - Concrete - Net wet well volume
$= 80 - 16 - 6 \times 4.27' \times (40-23)/27$
$= 64 - 16 = 48$ c y.

Compacted fill volume = 48 c y

d) Pumps : 1 x 25 HP @ 200 GPM / 1 Phase / 1800 rpm
2 x 75 HP @ 1,600 GPM / 3 Phase / 1800 rpm

e) Pump Station Controls (Included in Cost Estimate)

f) Discharge piping (Includind valve)

g) Hatch. (Not included in Cost Estimate)

h) Suction piping : (Included in Pumps)

List of Materials (Majors) and Cost Estimate.-

I.- Wet Weather Holding Pond.-

Description	QTY	UNIT	UNIT PRICE	TOTAL PRICE
Excavation	33,000	C.Y.	1.57	51,810
Comp. fill	22,400	C.Y.	3.14	70,336
Clay liner	4,000	C.Y.	7.85	31.400
Clear and Grub	3.6	acres	4,295	15,463

Sub-Total = $169.008.00

II.- Irrigation Pump Station.-

Excavation	80	C.Y.	L.S.	26,000.00 (See Page 11/42
Comp. fill	48	C.Y.		
Concrete	16	C.Y.		
Steel	1,800	Pounds		
Two pumps : 1600 GPM, 75 HP @ 1800 rpm motor. One pump : 200 GPM, 80 psi 1800 rpm		L.S		

II.- Irrigation Pump Station.-

- Steel : Floor Slab = #6 @ 9" : $\frac{22.33'}{0.75'} \times 4.27' + \frac{12'}{0.75'} \times 4.27'$

$$+ \frac{4.27'}{0.75'} \times 22.33' + \frac{4.27'}{0.75'} \times 12'$$

$$= 254.56' + 136.54' = 390.90'$$

: Walls : #5 @ 12" : Verticals : $\frac{(7.33' + 5.60') \times 2}{1'} \times 17'$

Horizontals : $\frac{17'}{1'} \times (7.33' + 5.60') \times 2$

$$= 439.62' + 439.62' = 879.24'$$

: Bottom : #5 @ 8" : $\frac{7.33'}{0.67'} \times 4.27' \times 2 \times 2 = 186.86'$

Total length : #6 – 390.90' = 390.90'
#5 – 879.24' + 186.86' = 1,066.10'

Final total length: #5 – 1,066.10' × 1.05 ≅ 1,120'
#6 – 390.90 × 1.05 ≅ 411'

Weight = #5 – 1,120' × 1.044 #/ft. = 1,169.28 #
#6 – 411' × 1.50 #/ft = 616.50 #
Total = 1,785.78 #

Alfaya Pump Station : Concrete

Floor Slab = 3.64 c.y.
Walls = 10.91 c.y.
Bottom Slab = 1.14 c.y.
} 15.69 c.y.

Reference Pump Station : Concrete. - See attached quotation : 08/07/2002.

Floor Slab $= \left[\frac{\pi \times (9.33)^2}{4} - \frac{48" \times 70"}{144} \right] \times 1\,ft. = 45.03\,ft^3 = 1.67$ c.y.

Walls $= \frac{\pi \times (9.33^2 - 8.00^2)}{4} \times 14.45\,ft = 261.58\,ft^3 = 9.69$ c.y.

Bottom Slab $= \frac{\pi \times (10.33)^2}{4} \times 1.33\,ft = 111.75\,ft^3 = 4.14$ c.y.

Total volume = 15.50 c.y

Ratio $= 15.69\,ft^3 / 15.50\,ft^3 = 1.01$

We will use as unit price = 14,725 × 1.01 = $ 14,872.25 as lump sum.
We will assume the wet well fabrication as 60% of the total cost.
Total cost = 14,872.25 / 0.60 = $ 24,787.

Update total cost = 24787 × 1.035 ≅ $ 25,655.00

8'ø Wet well : (As reference)

$$\text{Concrete: Top Slab} = \frac{\pi \times (9.33)^2}{4} \times 1' - \frac{(48" \times 70" - \text{Hatch})}{144} \times 1'$$

$$= 68.37 ft^3 - 23.33 ft^3 = 45.04 ft^3$$

$$\text{Walls} = \frac{\pi (\overline{4.67}^2 - \overline{4}^2)}{4} \times (4.70' + 10.75' - \text{Height})$$

$$= 4.56 ft^2 \times 15.45' = 70.45 ft^3$$

$$\text{Base} = \frac{\pi \times (10.33)^2}{4} \times 1.33' = 111.47 ft^3$$

$$\text{Total} = 226.76 ft^3 = 8.41 \text{ c.y.}$$

Unit prices considerations :

Based on E.N.R (See attached) we got the unit price as follows:

As the Construction Cost Index History has values just to 2001, it was necessary to extrapolate to estimate the 2003 value, taking in account the last ten years (From 1991 to 2000)

Difference between 1991 and 2000 = 6222 - 4835 = 1387

Price index 2003 (extrapolated) = 5210 (1993) + 1387 = 6597

- Compacted fill unit price on 1985 = 2.0 $/c.y. — 4195

Accumulated index from 1985 to 2003 = 6597 / 4195 = 1.57

Compacted fill price on 2003 = 2.0 $/cy x 1.57 = 3.14 $/c.y.

- Pond excavation unit price on 1985 = 1.00 $/c.y.

Difference between 1985 and 2003 = 6597/4195 = 1.57

Pond excavation unit price on 2003 = 1.00 $/c.y. x 1.57 = $1.57/c.y.

- Clay liner unit price on 1985 = 5.00 \$/c.y.

  Index difference between 1989 and 2003 = 6597/4195 = 1.57

  Clay liner unit price on 2003 = 5.0 \$/c.y. × 1.57 = 7.85 \$/c.y.

- Fine sand layer: We assume that this material was not used, but the compacted fill was placed as Fine Sand Layer. (5,600 c.y.)

  Also we assume that from material excavated, the Contractor used it as compacted fill.

  To calculate the compacted fill we used 20% as expansion factor.

- Clear and Grub: (Acre)

  Unit price on 2002: \$ 4,150 /acre (Taken from RSMeans - 2002)

  Indexes difference between 2002 and 2003 = 6597/6372 = 1.035

  Unit price on 2003 = 4,150 × 1.035 = \$ 4,295 /acre.

~~On Pump Station Wet Well~~ : N A.

~~We used the PRECAST [illegible] price as per quotation of 08/[illegible]/[illegible] (attached). We made an adjustment on concrete material as follows:~~

Final consideration:

We increased the final cost by 20% contingency.

Final Cost Estimate:

N. A.

1.- The Wet Weather Holding Pond : ~~145,444.30 x 1.20 ≈ $175,000...~~

2.- ~~The Irrigation Pump Station~~

03/26/03

ALAFAYA UTILITIES, INC. - COST ESTIMATE REV. #1

Wet Weather Holding Pond.-

Special fill material necessary to make the wet weather holding pond more absorbent : Thickness = 1'

Total area = 1,669.33 + 2,383.33 + 2,905.00 + 2,133.33 + 7,712.50 = 16,803.49 S.Y

Total volume = 16,803.49 S.Y. $\times \frac{1'}{3}$ = 5,601.16 C.Y.

Cost on February, 1989 = $1.30/C.Y.

Bringing unit price up to 2003 (As per NRCS Discount Rates and Price Indexes (E.N.R. Indexes) : 1989 – 4615; 2003 – 6597 } $\Delta \simeq 43\%$

Unit Price on 2003 = 1.30 x 1.43 = $1.86/C.Y.

Total cost special fill material = 5,601.16 C.Y x 1.86 $/C.Y.

= $10,418.16

03/26/03

ALAFAYA UTILITIES, INC.-

COST ESTIMATE :

WET WEATHER HOLDING POND :

Excavation	33,000	c.y.	1.57	51,810
Comp. Fill	22,400	c.y.	3.14	70,336
Clay Liner	4,000	c.y.	7.85	31,400
Clear and Grub	3.6	acres	4,295	15,462
Special fill material	5,601	c.y.	1.86	10,418.16

Total $ 179,425.86

Contingency (20%) $ 38,145.97

Total Cost Estimate $ 217.571.83

Say $ 218,000.00

IRRIGATION PUMP STATION .- (Reference Pages 11/42)

Excavation	80	c.y.
Comp. fill	48	c.y
Concrete	16	c.y.
Steel	1,800	pounds

} L.S. 26,000 x 1.20% (Conting.
= $31,200.

Say $31,200.00

03/26/03

ALAFAYA UTILITIES, INC.-

IRRIGATION PUMP STATION.-

PUMPS, PIPE, VALVES AND FITTINGS.-

PUMPS:

Two (2) Pumps, 1600 GPM, 75 HP, 1800 RPM Motor (Include suction piping) Cost Estimate : $ 39,120.06

One (1) Pump, 200 GPM, 80 psi discharge head, 1800 RPM Moto. (Include suction piping) Cost Estimate : $ 13,830.82

Control Panel in NEMA 3R enclosure with a 20HP and two 75 HP starters and other accessories

Cost Estimate = $ 52,000...

PIPE: 12" D.I.P. — 210 L.F. @ $65/L.F. = $ 13,650...

FITTINGS: 12"-45° Bend - Qty: 1 @ $981/EA = $ 981...

12"-8"x12" Red. - Qty. 1 @ $756/EA = $ 756...

12"-45° Bend, MJ - Qty: 1 @ $434/EA = $ 434...

VALVES : 12"-Check Valve, FLG - Qty: 1@ $5,686/EA = $ 5,686...

12"-Plug Valve, FLG - Qty: 1 @ $4,000/EA = $ 4,000...

Cost Estimate = $ 130,457.88

Contingency (20%) = $ 26,091.58

Total Cost Estimate = $ 157,000.00

Note: It's not included the bladder tank.-

For reference see Page 34/37

AFALAYA UTILITIES, INC. - 03/26/03

Other concrete structures, inside the Wet Weather Holding Pond:

INTAKE STRUCTURE: (Based in Sheet 14 of 18)

@ $3,500.../E.A. (Add to Frank from Dade Cty.)

(See Page 37/37

CONCRETE SPLASH PAD. - (As per Sheet 14 of 18)

Concrete =
12' x 9' x 4" Concrete Pad w/Energy Dissapator and 6"x6"x6" WWF.
Volume = 12' x 9' x 4/12 = 36 ft³ = 1.33 c.y.
6" Concrete Channel = 28.6' x 5' x 1' = 143 ft³ = 5.30 c.y.
Other little structures like, conc. pipe support, thrust blocks, etc. = 1.0 c.y.

Concrete Channel: w/6"x6"x6 WWF - Qty: 2

Pipes, valves and fittings:
10" D.I.P. — Length = 50 feet @ $ 50/L.F. = $ 2,500.00
Valves: 10" Plug Valve w/Valve Box : Qty: 1 $ 2,780.
Fittings: 10" - 90° Bend - Qty: 3 @ $465/EA $ 1,395.

Membrane TJ Conc. Structure in accordance with membrane manufacturers Recommendations: Area = 143 s.f. = 15.89 s.y.
Total concrete = 143 S.F. @ 2.75 $/S.F. = 393.25 $
Contingency (30%) = $ 2,120.48
Total Splash Pad = $ 9,188.73 ≅ $ 9,200.00

03/26/03

ATCHAFALAYA UTILITIES, INC.-

Force Main Discharge Structure:

12' x 8' x 4" Conc. Pad w/Energy Dissapator and 6"x6"x6 WWF
Concrete volume = 12'x8' = 96 S.F. @ 2.75 $/S.F. = $ 264.00
Pipe: 10" D.I.P. - Length = 50 feet @ $50/L.F. = $ 2,500.00
10" Plug Valve w/Valve Box: Qty: 1 = $ 2,780.00

Sub-Total = $ 5,544.00
Contingency (30%) = $ 1,663.20

Total = $ 7,207.20

Total Force Main Discharge Structure = $ 7,200.00

Revised Grand Totals:

1.- Wet Weather Holding Pond	$ 218,000.00
• Intake Structure	$ 3,500.00
• Splash Pad	$ 9,200.00
• Force Main Discharge Structure	$ 7,200.00
(Reference: Pag.: 2/37, 4/37, 12 & 13/37)	
Total W.W.H.P.	$ 237,900.00

03/26/03

AFALAYA UTILITIES, INC.-

II.- IRRIGATION PUMP STATION.-

• STRUCTURE (See page 10/37 & 16/37)	$ 31,200.
• PUMPS, PIPE. VALVES AND FITTINGS (See Pages 17/37 & 36/37	$ 157,000.
TOTAL I. P. S.	$ 188,200.

SUPPORT DOCUMENTS

JOB: ALAFAYA WOODS / WASTEWATER TREATMENT PLANT FROM: _____ TO: 8/25/85 ESTIMATE No. 1 2

CONTRACTOR: ARIES CONSTRUCTION, INC.

No.	Description	Quantity	Unit	Unit Price	Contract Amount	Completed Last Estimate	Completed This Period	Completed To Date	Value Of Work Completed
1	Clear plant site & easements	2.0	AC	1,000.00	2,000.00	2		2	2,000 00
2	Strip plant & pond sites	5,243	CY	1.00	5,243.00	5243		5243	5,243.00
3	Pond excavation	1,069	CY	1.00	1,069.00	1069		1069	1,069.00
4	Place embankment material	1,235	CY	2.00	2,470.00	1235		1235	2,470.00
5	Impervious cly core	255	CY	5.00	1,275 00	255		415	(800 + 475) 1,275 00
6	Sod for berms	7,194	SY	.99	7,122.06	100%			(1511 74) 7,122 06
7	~~Seed & mulch disturbed areas~~ REMOVE - BOGGY DID THIS	~~18,842~~	~~SY~~	~~.20~~	~~3,768.40~~				~~3,768.40~~
8	Grading for plant site		LS		2,500.00	100%		100%	2500.00
9	Stabilized road	736	SY	1.50	1,104.00		736	736	1,104.00
10	Concrete splash pads	6	EA	30.00	180.00		6	6	180.00
11	3" effluent risers	6	EA	198.00	1,188.00		6	6	1,188.00
12	12" equalizer pipe	36	LF		476.64		36	36	476.64
13	8" overflow pipe	40	LF		322.00	100%	40	40	322.00
14	8" SDR 21 w/ fittings	730	LF	8.95	6,533.50	730		730	6533.50 ✓
15	8" MJ gate valves	2	EA	455.00	910.00	2		2	910.00 ✓

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22/37

Economics & Analysis
What's New
State Info
Economic Tools
Example Analyses
Cost and Price Data
Technical Information
Cost and Returns Estimation
Clients Demographic
Economist Directory
Contents and Index
Downloads

NRIAI
The Natural Resources Inventory & Analysis Institute

NRCS Economics & Analysis Site

Economic and Watershed Technical Information

NRCS Discount Rates and Price Indexes

Construction Cost Index History (1908-2001)

from: http://www.enr.com/cost/costcci.asp

HOW ENR BUILDS THE INDEX: 200 hours of common labor at the 20-city average of common labor rates, plus 25 cwt of standard structural steel shapes at the mill price prior to 1996 and the fabricated 20-city price from 1996, plus 1.128 tons of portland cement at the 20-city price, plus 1,088 board-ft of 2 x 4 lumber at the 20-city price.

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL AVG
1977	2494	2505	2513	2514	2515	2541	2579	2611	2644	2675	2659	2660	2576
1978	2672	2681	2693	2698	2733	2753	2821	2829	2851	2851	2861	2869	2776
1979	2872	2877	2886	2886	2889	2984	3052	3071	3120	3122	3131	3140	3003
1980	3132	3134	3159	3143	3139	3198	3260	3304	3319	3327	3355	3376	3237
1981	3372	3373	3384	3450	3471	3496	3548	3616	3657	3660	3697	3695	3535
1982	3704	3728	3721	3731	3734	3815	3899	3899	3902	3901	3917	3950	3825
1983	3960	4001	4006	4001	4003	4073	4108	4132	4142	4127	4133	4110	4066
1984	4109	4113	4118	4132	4142	4161	4166	4169	4176	4161	4158	4144	4146
1985	4145	4153	4151	4150	4171	4201	4220	4230	4229	4228	4231	4228	4195
1986	4218	4230	4231	4242	4275	4303	4332	4334	4335	4344	4342	4351	4295

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL AVG
1987	4354	4352	4359	4363	4369	4387	4404	4443	4456	4459	4453	4478	4406
1988	4470	4473	4484	4489	4493	4525	4532	4542	4535	4555	4567	4568	4519
1989	4580	4573	4574	4577	4578	4599	4608	4618	4658	4658	4668	4685	4615
1990	4680	4685	4691	4693	4707	4732	4734	4752	4774	4771	4787	4777	4732

1991	4777	4773	4772	4766	4801	4818	4854	4892	4891	4892	4896	4889	4835
1992	4888	4884	4927	4946	4965	4973	4992	5032	5042	5052	5058	5059	4985
1993	5071	5070	5106	5167	5262	5260	5252	5230	5255	5264	5278	5310	5210
1994	5336	5371	5381	5405	5405	5408	5409	5424	5437	5437	5439	5439	5408
1995	5443	5444	5435	5432	5433	5432	5484	5506	5491	5511	5519	5524	5471
1996	5523	5532	5537	5550	5572	5597	5617	5652	5683	5719	5740	5744	5620
1997	5765	5769	5759	5799	5837	5860	5863	5854	5851	5848	5838	5858	5825
1998	5852	5874	5875	5883	5881	5895	5921	5929	5963	5986	5995	5991	5920
1999	6000	5992	5986	6008	6006	6039	6076	6091	6128	6134	6127	6127	6060
2000	6130	6160	6202	6201	6233	6238	6225	6233	6224	6259	6266	6283	6222
2001	6281	6273	6280	6286	6288	6319	6404	6389	6391	6397			

Base: 1913=100. Indexes revised for March, April and May 2000

ANNUAL AVERAGE					
1908	97	1931	181	1954	628
1909	91	1932	157	1955	660
1910	96	1933	170	1956	692
1911	93	1934	198	1957	724
1912	91	1935	196	1958	759
1913	100	1936	206	1959	797
1914	89	1937	235	1960	824
1915	93	1938	236	1961	847
1916	130	1939	236	1962	872
1917	181	1940	242	1963	901
1918	189	1941	258	1964	936
1919	198	1942	276	1965	971
1920	251	1943	290	1966	1019
1921	202	1944	299	1967	1074
1922	174	1945	308	1968	1155
1923	214	1946	346	1969	1269
1924	215	1947	413	1970	1381
1925	207	1948	461	1971	1581
1926	208	1949	477	1972	1753
1927	206	1950	510	1973	1895
1928	207	1951	543	1974	2020
1929	207	1952	569	1975	2212
1930	203	1953	600	1976	2401

24/37

RC BEACH & ASSOC. INC.

539 SAN CHRISTOPHER DRIVE DUNEDIN, FLORIDA 34698 USA
PHONE (727) 736-3696 FAX (727).733-2647
WWW.RCBEACH.COM

20-March-2003

Mr. George Garcia
Milian Swain & Assoc.
Miami, Florida
Fax: 305-441-0688

Dear Mr Garcia,

I have reviewed the information you gave me by telephone this morning and would offer you the following pumping equipment;

Item 1 (two pumps, 1600 GPM 75 HP, 1800 RPM motor)
2 each RuhRPumpen model 12D-200 3 stage vertical turbine pumps to pump 1600 GPM to a discharge head of 148' when operating at 1770 Rpm and driven by a 75 HP1800 RPM WP-! Enclosure vertical hollow shaft motor for 480 volt 60 hertz 3 phase current supply and with a NRR. The pump will be cast iron with bronze impellers, 416 SS pump and column shafting, 416 SS impeller collets and 10" cast iron discharge head with OSHA coupling guards
Price net FOB factory, Tulsa, Ok , is each $ 7948.00 X 2

We can offer the same pump but with six stages to develop 120 psig discharge pressure and with a 150 HP 1800 RPM motor for an additional $ 4,648.00

Item 2 (one pump, 200 GPM 80 psig discharge head, 1800 RPM motor)
1 each RuhRPumpen model 10A22 4 stage vertical turbine pump to pump 200 GPM to a discharge head of 185' (80 psig) when operating at 1760 RPM and driven by a 15 HP 1800 RPM WP-1 enclosure vertical hollow shaft motor for 480 volt 60 hertz 3 phase current supply and with a NRR The pump will be cast iron construction with bronze impellers, 416 SS pump and column shafting, 416 SS impeller collets and 6" cast iron discharge head with OSHA coupling guards
Price net FOB factory, Tulsa, Ok. is each $ 5,620.00

The Tulsa, Ok plant of Byron Jackson was purchased by RuhRPumpen, Inc. in 2001 The personell remain the same.

Shipment will require 10 to 12 weeks No Florida sales or use tax has been included if it Should apply. Performance curves and preliminary elevation drawings are attached.

Very truly yours,

Robert C Beach

25/37

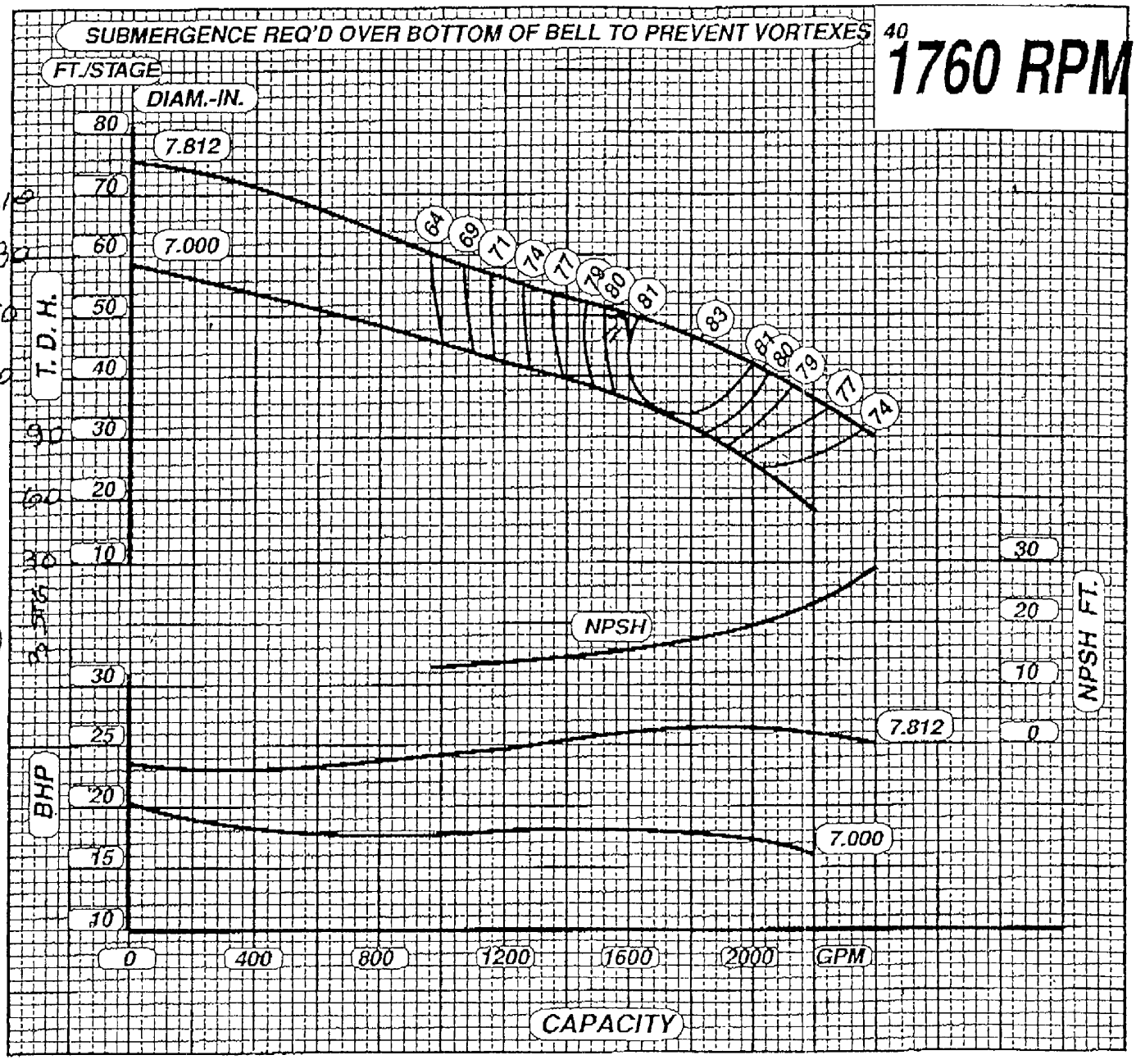
VERTICAL TURBINE PUMP

RUHRPUMPEN MODEL: 12D-200

60 HERTZ

Curve No.: VTP238

Date: JANUARY 2000



Efficiency shown is for 2 stages or more, with standard materials. For fewer stages change efficiency as shown.			
No. of stages	Eff change	No. of. stages.	Eff. change
1	-3.0	4	-2.0
2	———	5	-2.0
3	-1.0	6	-2.0

TECHNICAL DATA	KG.	LBS.
Bowl wt. addl stage (lbs.)	46	101
Rotor wt. per stage (lbs)	12	27
Bowl wt first stage (lbs.)	125	275
Thrust factor	14.5	
Max bowl horsepower	240	
Impeller eye area (sq. inch.)	33.4	

SERVICE CONDITIONS

CUSTOMER	FLUID	SP GR: 1.0	VIS.
SERVICE	CAPACITY. 1600	BHP 74	EFF..
DATE	HEAD. 148	NPSHA:	NPSHR.

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26137

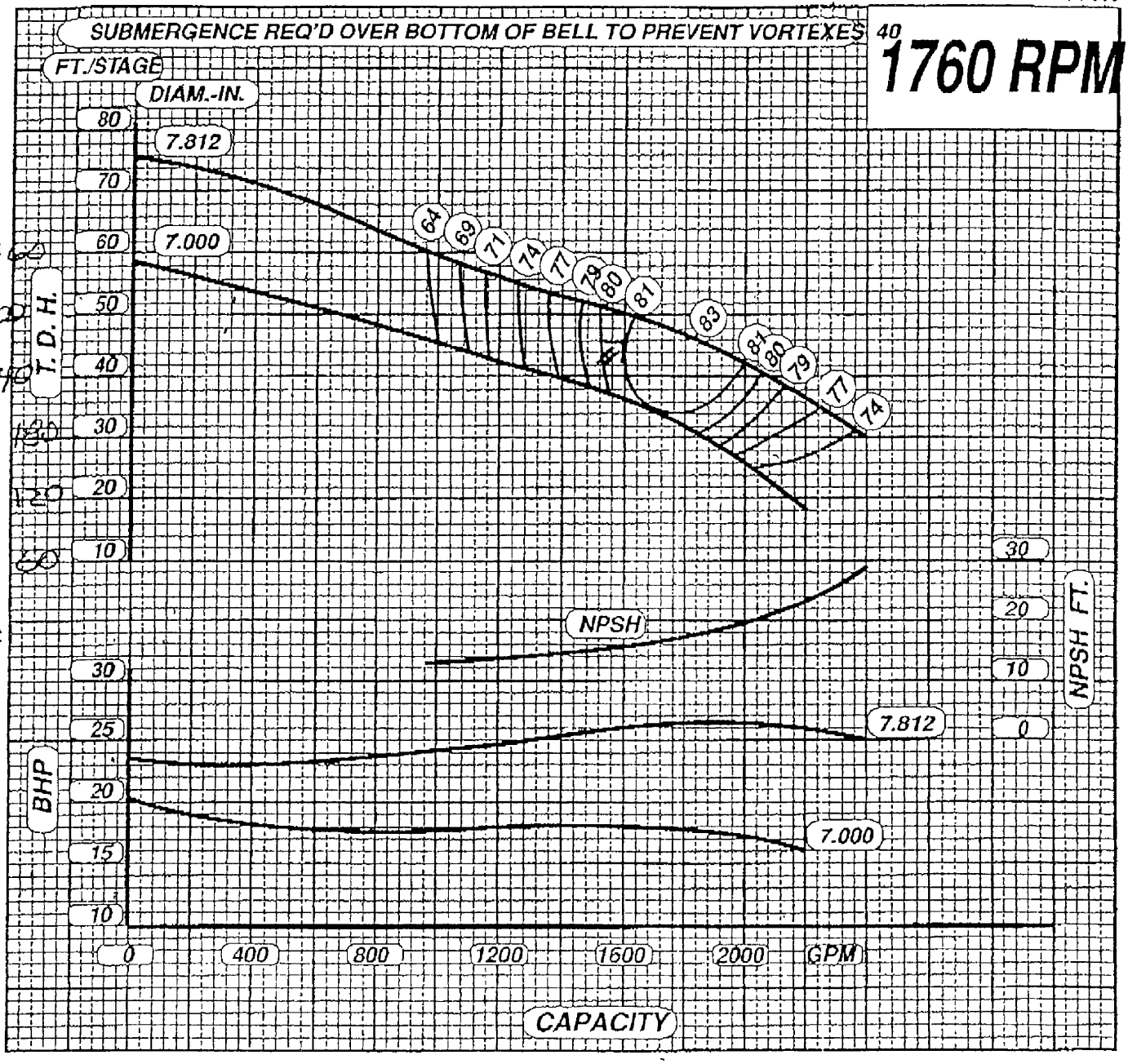
VERTICAL TURBINE PUMP

RUHRPUMPEN MODEL: 12D-200

60 HERTZ

Curve No.: VTP238

Date: JANUARY 2000



Efficiency shown is for 2 stages or more, with standard materials. For fewer stages change efficiency as shown.			
No. of stages.	Eff. change	No. of stages.	Eff. change
1	- 3.0	4	- 2.0
2	———	5	- 2.0
3	- 1.0	6	- 2.0

TECHNICAL DATA	KG.	LBS.
Bowl wt. add'l stage (lbs.)	46	101
Rotor wt. per stage (lbs.)	12	27
Bowl wt. first stage (lbs.)	125	275
Thrust factor	14.5	
Max bowl horsepower	240	
Impeller eye area (sq. inch.)	33.4	

SERVICE CONDITIONS

CUSTOMER	FLUID	SP GR.: 1.0	VIS..
SERVICE.	CAPACITY. 1600	BHP 148.5	EFF.
DATE.	HEAD. 277'	NPSHA.	NPSHR

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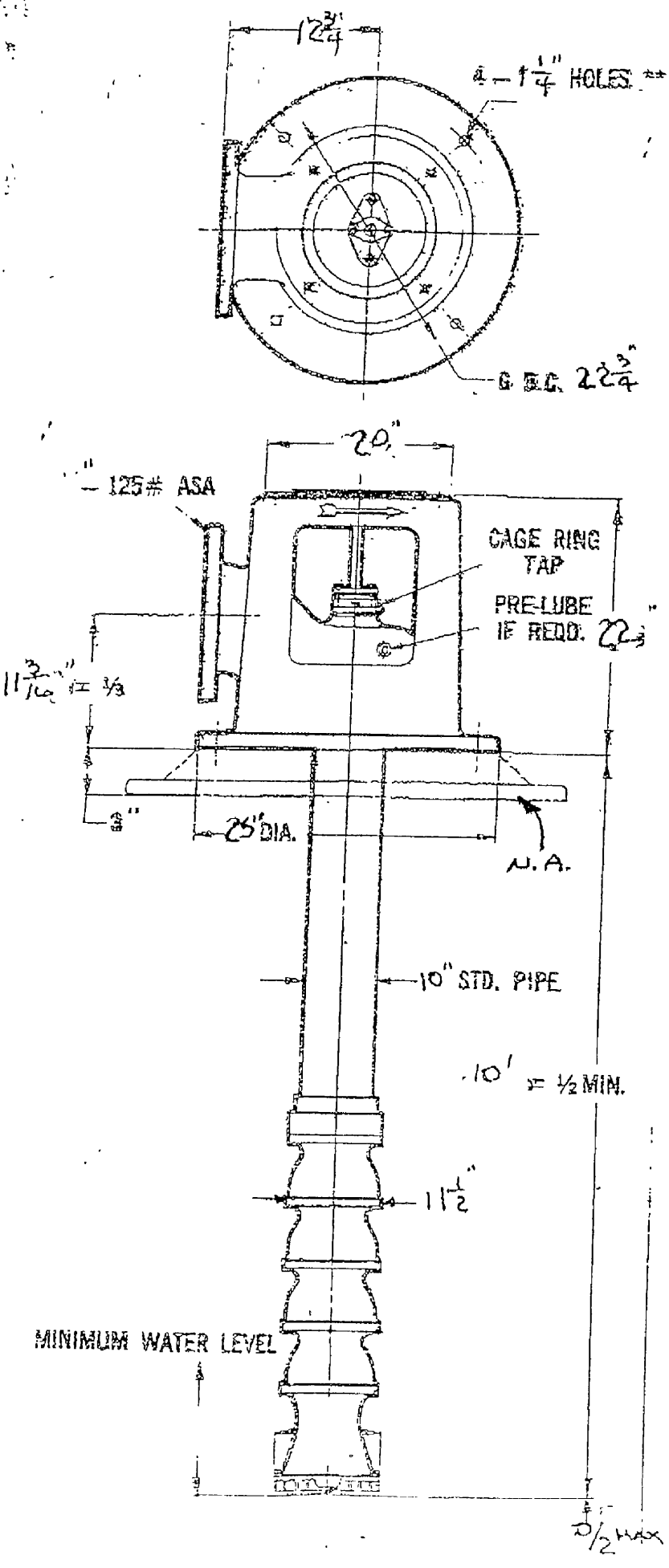
27/37



MODEL 12D200

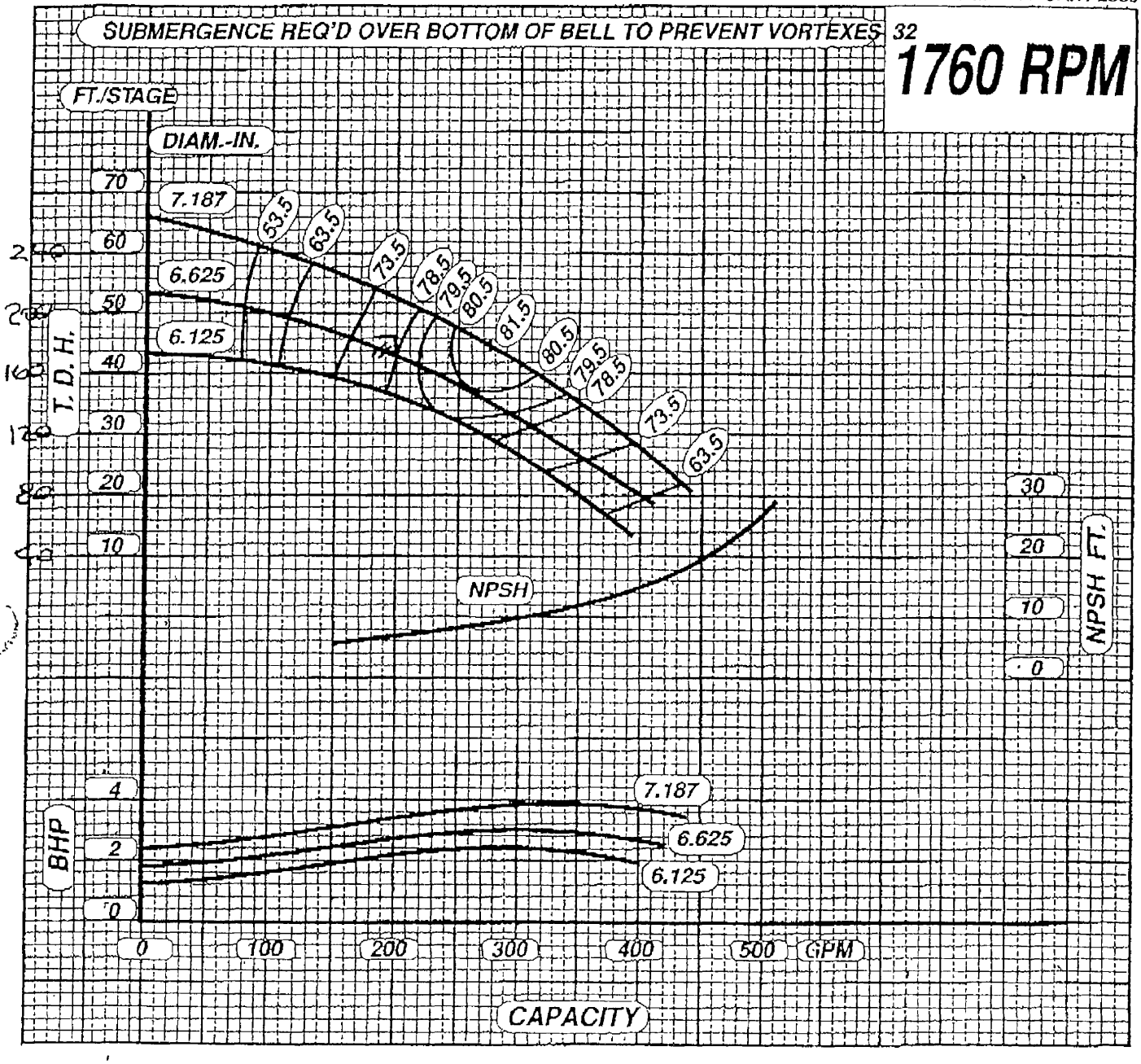
VERTICAL TURBINE PUMP

RUHRPUMPEN MODEL: 10A-22

60 HERTZ

Curve No.: VTP160

Date: JANUARY 2000



Efficiency shown is for 4 stages or more, with standard materials. For fewer stages change efficiency as shown			
No. of stages.	Eff. change	No. of stages	Eff change
1	- 3.0	4	
2	- 2.0	5	
3	- 1.0	6	

TECHNICAL DATA	KG.	LBS.
Bowl wt. addl stage (lbs.)	26	57
Rotor wt per stage (lbs.)	6	14
Bowl wt. first stage (lbs.)	74	163
Thrust factor	4	
Max bowl horsepower	140	
impeller eye area (sq inch)	7.8	

SERVICE CONDITIONS

CUSTOMER.	FLUID:	SP GR. 1.0	VIS.:
SERVICE.	CAPACITY: 200	BHP: 11.97	EFF.
DATE	HEAD: 185'	NPSHA:	NPSHR:

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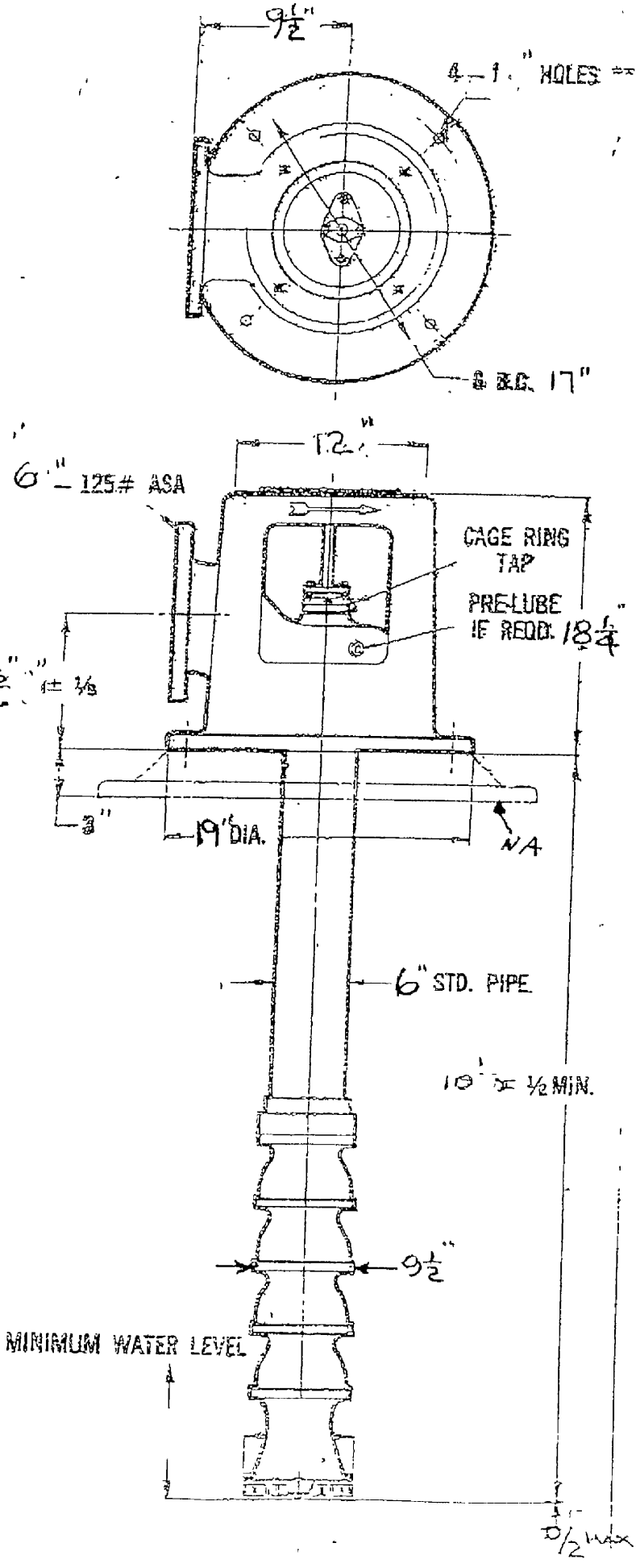
29/37



MODEL 10A22

30/37

ALAFAYA

R C BEACH & ASSOC. INC.

539 SAN CHRISTOPHER DRIVE DUNEDIN, FLORIDA 34698 USA
PHONE (727) 736-3696 FAX (727) 733-2647
WWW.RCBEACH.COM

26-March-2003

Mr George Garcia
Milian Swain & Assoc.
Miami, Fl
Fax: 305-441-0688

Dear George,

Confirming our telephone conversation of this morning, we can offer a control panel in NEMA 3R enclosure with a 20 HP and two 75 HP starters and other accessories as detailed on the attached control panel material list for $ 20,365.00 net FOB Apopka, Fl.

Please note the starters are soft start type with little or no inrush current demand.

The small pump will start and run until the next level up stops it and starts one of the larger pumps. On rising level to the next float, the second large pump will start and run with the other large pump. On falling level, the large pumps will drop out until the last large pump stops and the small pump is started and runs until the low level is reached and the small pump will be stopped. There will be a high level float to start a visual and audible alarm, should the two large pumps not meet the demand when running together

An alternator will alternate the lead and lag large pumps.

After you have reviewed this, if we can be of further information or answer more specific questions, please call me

Very truly yours,

R.C. Beach & Assoc., Inc.

Control Panel Material List

3/21/2003

Tel (407) 298-5940
Fax (407) 298-2227

TO. R.C.Beach & Assoc. ATTN. Bob Beach QUOTE NO. 67113AA PUMP MODEL.

HP 20 75 VOLTAGE 480 PHASE. 3 WIRE. 3 NO PUMPS/MOTORS. 3 PUMP FLA.

JOB NAME. Milian Swain & Assoc. (1- 20Hp & 2- 75HP)

ENCLOSURE 60X80 APPROX 16" DEEP
- [ ] NEMA 1
- [X] NEMA 3R
- [ ] NEMA 4
- [ ] NEMA 4X
- [ ] NEMA 7
- [ ] NEMA 9
- [ ] NEMA 12
- [ ] BOX IN BOX
- [ ] MCC

MATERIAL
- [ ] ALUMINUM
- [ ] FIBERGLASS
- [ ] 304 STAINLESS
- [ ] 316 STAINLESS
- [X] STEEL
- [ ] SPECIAL PAINT

MODIFICATIONS
- [X] AIR VENTS W/FAN
- [ ] ALARM CAGE
- [ ] CAST ALUM HANDLE/3 PT LATCH
- [ ] COPPER GROUND BUS
- [X] DEAD FRONT
- [ ] DRAINS
- [X] DRIP SHIELD
- [ ] LATCH (3 PT)
- [ ] LEGS
- [ ] PARTITION
- [ ] SKIRTS
- [ ] ST STEEL LEGEND SCREWS
- [ ] SUN SHIELD
- [ ] WINDOW
- [ ] AIR CONDITIONER

MOTOR STARTERS
- [ ] AMBIENT OVERLOADS
- [ ] AUX CONTACTS
- [X] IEC ISOL OR BYPASS
- [ ]
- [ ] RVAT
- [X] SOLID STATE
- [ ] SOLID STATE OVERLOADS
- [ ] TWO SPEED
- [ ] VFD
- [ ] VFD - LINE FUSES
- [ ] VFD - LINE REACTORS
- [ ] Y-DELTA

BREAKERS [D]
- [ ] AUX CONTACTS
- [X] CONTROL
- [ ] EMERGENCY
- [ ] EXTRA SINGLE POLE
- [ ] FUSIBLE DISCONNECT
- [ ] GEN RECEPTACLE
- [ ] HANDLES
- [X] HEAVY DUTY
- [ ] LIGHTING PANEL
- [ ] MAIN
- [ ] MDP
- [X] MOTOR
- [ ]
- [X] POWER TERMINALS
- [ ] Q FRAME
- [ ] RECEPTACLE
- [ ] TRANSFORMER
- [ ] WALKING BEAM SYSTEM

CONTROL SYSTEM
- [ ] [ ]
- [ ] BUBBLER
- [ ] DIGITAL PUMP CONT
- [ ]
- [X] FLOAT SYSTEM (5) NO FLOATS INCL
- [ ] PLC
- [ ]
- [ ] PLC OPERATOR INTERFACE
- [ ] SIMPLEXOR
- [ ] START/STOP PB'S
- [ ] TRANSDUCER
- [ ] TRANSDUCER-ADDIT CABLE
- [ ] ULTRASONIC
- [ ]
- [ ] I.S. WARRICK CONTROLLER

OPTIONS
- [ ] AC/W/TANK
- [ ] ACCUMULATOR
- [ ] AIR COMPRESSOR
- [X] ALARM HORN
- [X] ALARM LIGHT
- [X] ALARM SILENCE
- [ ] ALARM TEST
- [X] ALTERNATOR
- [ ] AMMETER W/CT'S
- [ ] AWG #14 WIRING
- [ ] BEARING PL
- [ ] BREAKER TRIP PL
- [ ] COUNTERS
- [ ] DC ALARM/BAT BACK UP
- [ ] DIALER
- [ ] DIM GLOW LIGHTS
- [ ] ELAPSED TIME METERS
- [ ] ETM SIMULTANEOUS
- [ ] FLOAT TEST SWITCH
- [ ] GRD. FAULT RECEPT
- [ ] GRD FAULT SYSTEM
- [ ] GRD. MONITOR RELAYS
- [ ] HEATER/THERMOSTAT
- [ ] INDUSTRIAL RELAYS
- [ ] INSULATION
- [X] INTRINSIC BARRIER
- [ ] INTRINSIC RELAYS
- [ ] JUNCTION BOX
- [ ] LEVEL GAUGE
- [ ] LEVEL LIGHTS
- [ ]
- [ ] MODULE (1PH)
- [ ] MOISTURE PL
- [ ] NEMA 4 H-A, SPRING RET
- [X] NEMA 4 HOA
- [ ] NEMA 4 LIGHTS
- [ ] O & M MANUAL
- [ ] ON/OFF SWITCH
- [ ] OVERLOAD PL
- [ ] OVERLOAD RESETS
- [X] PHASE MONITOR
- [ ] POWER ON LIGHT
- [ ] PUMP FAIL PL
- [ ] PUSH TO TEST
- [ ] REMOTE ALARM TERM
- [ ] RESETS
- [X] RUN LIGHTS
- [ ] SERVICE ENT LABEL
- [ ] SUB-MEGS
- [X] SURGE ARRESTOR TVSS
- [ ] SURGE CAPACITOR
- [ ] THERMAL PL
- [X] THERMAL TERMINALS
- [ ] TIME CLOCK
- [ ] TIME DELAY RELAYS
- [ ] TIMER, REPEAT CYCLE
- [ ] TOGGLE HOA
- [ ] TRANS. LIGHTS
- [X] TRANSFORMER
- [ ] TRANSFORMER 24 VAC
- [ ] TROUBLE LIGHT/SWITCH
- [X] TVSS TE/5XF
- [X] UL 508
- [ ] VOLTMETER

OTHER
- [ ] STARTUP
- [ ]
- [ ]
- [ ]

NOTES:
1). Floats- By RCB
2). Qt'd. Solid-State Starters w/ IEC Isolation
3). No Starter 'By-Pass' in pricing.
4). Install, StartUp or On-Site Test-By Others.

Sta-Con In

	Schedule:	Weeks:
Estimated Production Time from release of order	Drawings:	
	Shipment:	

PRICE $18,221
FROM Bill Parker
ORIGINAL DATE

Generally excluded from the above quoted prices are the following: Motors - Internal motor sensing devices - Mounting hardware - Field disconnects and junctions boxes - remote operator devices - Field installation or wiring - Any field devices unless explicitly listed

Quotes are valid for 90 days from the date of the quote

One copy of electronic submittals is included in the quote

Engineering time for submittal drawings will be billed if the job is cancelled after submittals

Quote is based on the information supplied at the time of the quote, incorrect or incomplete information may void the quote.

Please refer to the above quote number on all inquiries.

PRECAST 4 US CORP.
Specialty Precast Products
Precast 4 U.S Corporation
New Mailing address
P. O. Box 960068 Miami, Fla 33296-0068
New Phone # (305) 383-1711
New Fax # (305) 383-2080

QUOTATION

PLEASE INDICATE THE ABOVE NUMBER WHEN ORDERING

TO

QUOTATION DATE	SALESPERSON
8/9/2002	EDGARD SUCRE
INQUIRY DATE	INQUIRY NUMBER

ATTN. JORGE A. GARCIA
REF. PUMP STATION # 135

QUANTITY	DESCRIPTION	UNIT PRICE	AMOUNT
1	8' ϕ WET WELL WITH 16" BASE 12" TOP SLAB. (WEIGHT = 21 TONS)	14,725.00	14,725.00
1	6'x 7'-1" VALVE BOX WITH 15" BASE 12" TOP SLAB.	2,850.00	2,850.00
	– HATCHES SUPPLIED BY THE CONTRACTOR.		
	– UNLOADING @ JOBSITE BY THE CONTRACTOR		
	– 15-20 WORKING DAYS FOR DELIVERY.		

WE ARE PLEASED TO SUBMIT THE ABOVE QUOTATION FOR YOUR CONSIDERATION. SHOULD YOU PLACE AN ORDER, BE ASSURED IT WILL RECEIVE OUR PROMPT ATTENTION. THIS QUOTATION IS SUBJECT TO THE CONDITIONS PRINTED ON REVERSE SIDE AND IS VALID FOR 30 DAYS. THEREAFTER IT IS SUBJECT TO CHANGE WITHOUT NOTICE

BY [signature] ACCEPTED ______ DATE ______

40% Pre Consumer Content • 10% Post Consumer Content

SIGN AND RETURN YELLOW ACCEPTANCE COPY WHEN ORDERING

Thank You!

FROM PRECAST 4 US CORP ... 09 2002 01:18PM ... P01

PURCHASE ORDER

No. 69495 35/37

DATE February 3, 1989

AUTHORIZED BY:

PURCHASER:
ALAFAYA UTILITIES
1404 EL CAJON CT.
WINTER SPRINGS, FL 32708

CONTRACTOR:
Fore Golf
316 N. Bermuda Ave.
Suite 5
Kissimmee, FL 32741

Subdivision: Twin Rivers Golf Course / effluent Disposal Job # 894

Lots Or # Of Units Affected:

Cost Per Unit Of Change:

SUBJECT OF CHANGE

TWIN RIVERS GOLF COURSE

PARTIAL NECESSARY WORK TO DATE TO COMPLETE WET WEATHER HOLDING POND. TO HOLD THE EFFLUENT DISPOSAL FROM PLANT. $ 96,176.40

FILL MATERIAL NECESSARY TO CREATE THE EFFLUENT DISPOSAL CONDITION ON THE GOLF COURSE FOR THE PLANT TO FUNCTION PER THE SINGHOFEN AND ASSOCIATES OPINION OF COST DATED 12-19-88
49,230CY @1.30 63,999.00

$160,175.40

Job # 894

NOT RESPONSIBLE FOR MATERIAL DELIVERED WITHOUT AN AUTHORIZED PURCHASE ORDER

PURCHASER	SUPPLIER	TOTAL
	WE HAVE READ AND APPROVED ALL TERMS AND CONDITIONS OF PURCHASE AS NOTED ON THIS PURCHASE ORDER.	$160,175.40
AUTHORIZED SIGNATURE	AUTHORIZED SIGNATURE	PROJECT #
TYPED NAME AND TITLE	TYPED NAME AND TITLE	COST CODE
2-27		☐ ON-SITE
DATE	DATE	☐ OFF-SITE

PAYMENT REQUESTS RECEIVED BY THE PURCHASER ON OR BEFORE THE 15th OF THE MONTH WILL BE PAID BY THE LAST DA THE SAME MONTH. APPLICABLE DISCOUNTS WILL BE TAKEN WHEN PAYMENT IS MADE ON OR BEFORE THE LAST DAY OF T MONTH. PLEASE REFER TO P.O. NUMBER ON ANY CORRESPONDENCE OR PAYMENT REQUESTS.

34/37

Hughes Supply, Inc.
1400 NW 110th Ave
Miami, FL 33172
Branch # 7001

ALAFAYA

HUGHES

** Fax **** Fax **** Fax **** Fax **** Fax **** Fax **** Fax **** Fax **

To : JORGE GARCIA

Fax# : 1-305-441-0688

From : Geovany Rivera

Message : THANK YOU

** Fax **** Fax **** Fax **** Fax **** Fax **** Fax **** Fax **** Fax **

HUGHES

HUGHES SUPPLY INC # 7001
7001 MIAMI WATER & SEWER
1400 NW 110TH AVE
MIAMI FL 33172-1909
305-477-2383 Fax 305-477-7340

35/37

** Q U O T A T I O N **

S104000886
11:15:08 26 MAR 2003
Page # : 1 of 1

Sold To: 138733
MILIAN SWAIN AND ASSOCIATES
2025 SW 32 AVE.
MIAMI, FL 33145
305-441-0123 Fax 305-477-7840

Ship To: 138733
MILIAN SWAIN AND ASSOCIATES
2025 SW 32 AVE.
MIAMI, FL 33145
305-441-0123 Fax 305-477-7840

Ordered By	Ship Via	Quote Date	
	OT OUR-TRUCK	03/26/03	
Writer	Frieght Terms/FOB	Expiration Date	
Geovany Rivera		04/25/03	
Salesperson	Terms	FOB	
House Sales Person	CASH		

Special Instructions **********
*
*
****

Quantity	UM	Product Description	FD		Unit Price	UM	Net Amount
1	ea	TY 296676 12X8 C110 ECC RED FLNG			302.200	ea	302.20
1	ea	MU-CO 120A260006 12IN CHECK VALVE			2274.322	ea	2274.32
1	ea	DEZURIK 12" FLG ECCENTRIC PLUG VALVE, C550 EPOXY LINED, 316SS BODY BOLTS, NUTS, ETC., GEAR & HW OPER.			1600.000	ea	1600.00
2	ea	TY 123415 BEND,12,FE,C110,45,CL			392.300	ea	784.60
209	ft	12 CL350 SLIP JT PIPE EPOXY			25.000	FT	5225.00
1	ea	TY 072928-L/ACC 12IN C153 MJ 45D BD			173.503	ea	173.50
		I WILL NEED TO KNOW WHEN THIS ORDER IS GOOD BECAUSE THE LEAD TIME IS ABOUT A MONTH					

Total Weight	7718.6 lbs	Subtotal	10359.62
THIS IS A QUOTATION		S & H	0.00
Prices are firm for 30 days. subject to change without notice after 30 days		Tax	671.58
APPLICABLE TAXES EXTRA!		Total Amount	11031.20

03/26/03

ALAFAYA UTILITIES, INC.

COST ESTIMATE.-

PUMPS.-

As per RC BEACH & ASSOCIATES, INC. quotation (See Page 29/42)

Price net FOB Factory, Tulsa, OK, is:		$ 21,516.00
Florida sale Taxes (7%)	:	$ 1,506..
Sub-total		$ 23,022.12
Installation (50%)	:	$ 23,022.12
Sub-total	:	$ 46,044.24
Profit (15%)	:	$ 6,906.64
Total	:	$ 52,950.88

Control Panel:

Price net FOB Apopka, FL	$ 20,365..
Installation (55%)	$ 24,890.56
Sub-total	$ 45,255.56
Profil (15%)	$ 6,788.33
Total	$ 52,043.89

(Reference Pag. 18/42 & 35/42)

FEMA - FUNDED PROJECTS
QUANTITY COMPARISON
PW 203-5785
T 52 R 41 S 08

ITEM NUMBER	DESCRIPTION	FEMA'S UNIT COSTS		203-5785 (APPROVED LENGTH = 0 10 MILES)		
		UNIT	UNIT COST	APPROVED BY FEMA RECONSTRUCTION COST	PROPOSED RECONSTRUCTION QUANTITY	PROPOSED RECONSTRUCTION COST
101 - 1	MOBILIZATION	EA	$ 500 00		2 00	$1,000 00
102 - 74	BARRICADES - TEMPORARY / TYPES I - II - VP & DRUM	EA / DAY	$ 0 37		60 00	$22 20
102 - 75	CONSTRUCTION SIGNS - TEMPORARY - POST MOUNTED	EA / DAY	$ 1 00		40 00	$40 00
102 - 76	FLASHING ARROW BOARD - TEMPORARY	EA / DAY	$ 20 00		10 00	$200 00
327 - 70 - 01	MILLING EXISTING ASPHALT PAVEMENT - UP TO 5,000 SY PER WO - 1" AVERAGE DEPTH	SY	$ 3 00			
	MILLING EXISTING ASPHALT PAVEMENT - 5,000 TO 15,000 SY PER WO - 1" AVERAGE DEPTH	SY	$ 1 00			
327 - 70 - 02	MILLING EXISTING ASPHALT PAVEMENT - UP TO 5,000 SY PER WO - 2" AVERAGE DEPTH	SY	$ 4 00			
	MILLING EXISTING ASPHALT PAVEMENT - 5,000 TO 15,000 SY PER WO - 2" AVERAGE DEPTH	SY	$ 2 00			
331 - 72 - 10	ASPHALTIC DRIVEWAY RESTORATION - INCLUDES 6" LIMEROCK BASE & 1" THICK TYPE S-1 ASPHALTIC CONCRETE	SY	$ 18 00			
110 - 4	REMOVE EXISTING PAVEMENT	SY	$ 12 00		620 00	$7,440 00
120 - 1 - 1	ROADWAY EXCAVATION	CY	$ 5 00		240 00	$1,200 00
160 - 4	TYPE "B" STABILIZATION - 12" THICK - DOUBLE COURSE & PRIMED	SY	$ 2 25			
200 - 1 - 2	LIMEROCK BASE - 8" THICK - BR 40	SY	$ 7 50		710 00	$5,325 00
331 - 3	TYPE S-1 ASPHALT CONCRETE - 1" THICK ASPHALT - (ESTIMATED 18 SY PER TON)	TON	$ 60 00			
331 - 3	TYPE S-1 ASPHALT CONCRETE - 2" THICK ASPHALT - (ESTIMATED 9 SY PER TON)	TON	$ 60 00		70 00	$4,200 00
425 - 5A	MANHOLE ADJUSTMENT - SEWER MANHOLES	EA	$ 175 00			
706 - 1 - 12	REFLECTIVE PAVEMENT MARKERS - RPM - BI-DIRECTIONAL	EA	$ 4 50		30 00	$135 00
425 - 6	ADJUST VALVE BOXES - MIAMI-DADE WATER & SEWER ONLY	EA	$ 100 00		2 00	$200 00
711 - 4	DIRECTIONAL ARROWS - THERMOPLASTIC	EA	$ 50 00			
711 - 33 - 34	SKIP TRAFFIC STRIPE ((4" WHITE / YELLOW) (10' STRIPE & 30' SKIP)) - THERMOPLASTIC	LF	$ 0 50			
711 - 35 - 41	SOLID TRAFFIC STRIPE (4" WHITE) THERMOPLASTIC	LF	$ 0 40		660 00	$264 00
	SUBTOTAL ASPHALT REPAIRS					**20,026.20**
712	**DRAINAGE: HAZARD MITIGATION**					
443 - 70 - (301,305,309,313,317)	EXFILTRATION TRENCH WITH 18" PERFORATED PIPE BOTTOM ELEV (-) 2	LF	$ 41 00		155 00	$6,355 00
430 - (1-15 1-15B,3-15,3-15B,8-15,9-15)	15" DIAMETER STORM SEWER PIPE CONNECTION	LF	$ 28 00		35 00	$980 00
430 - (1-18,1-18B,3-18,3-18B,8-18,9-18)	18" DIAMETER STORM SEWER PIPE CONNECTION	LF	$ 31 00			
425 - 1	SWALE INLET TYPE D-1 (17" x 27") (< 10' DEEP)	EA	$ 1,200 00			
425 - 1 - 35	CURB INLET TYPE P-5 - ANY DIMENSION - 15" DEEP MAXIMUM	EA	$ 2,050 00			
425 - 1 - 36	CURB INLET TYPE P-6 - ANY DIMENSION - 15" DEEP MAXIMUM	EA	$ 2,550 00			
425 - 11B	CATCH BASIN - DRAIN FIELD - STUB PIPE	EA	$ 3,150 00		3.00	$9,450 00
425 - 2 - 71	MANHOLE TYPE J-7T - ANY DIMENSION - 15" DEEP MAXIMUM	EA	$ 2,840 00		2 00	$5,680 00
520 - 1 - 2	CONCRETE CURB & GUTTER - TYPE F - 6" CURB - 18" - RECONSTRUCTION	LF	$ 15 00			
522 - 1	CONCRETE SIDEWALK - 4" THICK - CLASS I - RECONSTRUCTION	SY	$ 19 40		96 00	$1,862 40
538 - 1	GUARDRAIL - INCLUDES REMOVAL AND RESTORATION MATCHING THE EXISTING	LF	$ 25 00			
575 - 1	SODDING - PENSACOLA BAHIA OR MATCH EXISTING	SY	$ 3 00		380 00	$1,140 00
120 - 8	SWALE RESTORATION - REGRADE EXISTING SWALE	SY	$ 5 00		380 00	$1,900 00
580 - 332 - 1	TREE REMOVAL & REPLACEMENT - INCLUDING WATERING - LESS THAN 6" DIAMETER	EA	$ 156 00			
580 - 332 - 2	TREE REMOVAL & REPLACEMENT - INCLUDING WATERING - LESS THAN 6" - 12" DIAMETER	EA	$ 228 00			
331 - 72 - 1A	ROADWAY PAVEMENT RESTORATION (REPLACE & MATCH EXISTING BASE THICKNESS AND WEARING COURSE WITH 8" MIN PRIMER LIMEROCK BASE, AND 1" THICK S-1 ASPHALTIC CONCRETE - RECONSTRUCTION INCLUDES REPLACEMENT OF EXISTING PAVEMENT MARKINGS) - SEE NOTE # 2	SY	$ 18 00			
331 - 72 - 10B	INLET PAVEMENT - INCLUDES 6" LIMEROCK BASE - PRIMED - 1" THICK S-1 ASPHALTIC CONCRETE	SY	$ 20 50		80 00	$1,640 00
	SUBTOTAL HAZARD MITIGATION					**$29,007.40**
	CONSTRUCTION COST (ASPHALT REPAIRS + HAZARD MITIGATION)					$49,033 60
	10% CONTINGENCY ACCOUNT					$4,903 36
	SUBTOTAL COST					**$53,936.96**
900 - 1	PROJECT MANAGEMENT ENGINEERING DESIGN - GEOTECHNICAL - INSPECTION	LS				$3,775 59
	TOTAL COST			**$54,013.20**		**$57,712.55**

(1) MET PROPOSES UP TO 2" THICK RESURFACING AND NO FRICTION COURSE
(2) THERE WILL BE NO SEPARATE PAYMENT FOR ROADWAY WHEN ASSOCIATED WITH THE INSTALATION OF PIPE CULVERTS FRENCH DRAINS OR OTHER DRAINAGE STRUCTURES
COST OF PAVEMENT RESTORATION ASSOCIATED WITH PIPE CULVERTS, FRENCH DRAINS AND OTHER DRAINAGE STRUCTURES IS INCLUDED IN DRAINAGE PAY ITEMS
(3) ENGINEERING DESIGN INDICATES 18" EXFILTRATION TRENCH IS ADEQUATE
(4) THE UNIT PRICE FOR ALL ITEMS WERE OBTAINED FROM CTE
(5) THESE ITEMS ARE REQUIRED BY MIAMI-DADE COUNTY PUBLIC WORKS STANDARDS