Warren County Water and Sewer Company

Original Cost Less Depreciation

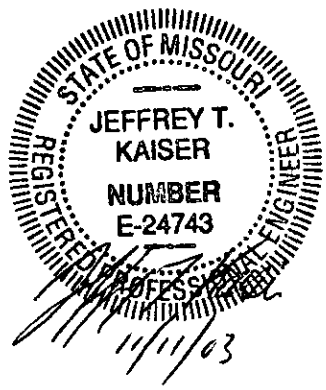
Supporting Documentation

Attachment 1
OCLD Calculation Spreadsheets

Attachment 2
Cost Estimate Cross Sections and Calculations

Attachment 3
RS Means and Related Cost Data

Exhibit No. 2
Case No(s). WM-2004-0132
Date 11-12-03 Rptr KF



Prepared by

Black & Veatch Corporation
November 2003

Warren County Water and Sewer Company

Development of Original Cost Less Depreciation

Narrative of Development Procedures

General:

Black & Veatch Corporation was retained by the Missouri American Water Company to develop an estimate of the "Original Cost Less Depreciation" for the infrastructure of the Warren County Water and Sewer Company (WCWSC). This depreciated value, as further discussed in the following pages, is based upon the development of an estimated cost to construct the system as it is currently configured, trending (reduction) of those estimated costs to reflect construction costs during the approximate year of construction for the various system components, and depreciation of those trended costs through the year 2002.

Existing infrastructure:

Comprised mainly of the water and sewer infrastructure of the Incline Village development and three adjacent smaller developments in Warren County Missouri, the major infrastructure of the WCWSC includes:

- 1500 foot deep potable water supply well
- 32,000 gallon water storage standpipe
- Potable water distribution piping including approximately 58,000 lineal feet of water lines
- Two pre-manufactured Wastewater Treatment Plants
- Four wastewater pump stations
- Wastewater collection system piping including approximately 46,000 lineal feet of sewers and 13,400 lineal feet of forcemains

Development of construction costs:

To prepare an estimated construction cost, Black & Veatch first reviewed existing documentation and conducted a site visit to view the various components of the infrastructure. This site visit included brief inspections of various components of the system including the two wastewater treatment plants, two pump stations, typical grinder pump station and water meter installations, various manholes, the potable water well and standpipe, and a driving tour of the development area.

Utilizing the mapping, MDNR reports, site visit, and other data made available, Black & Veatch then developed an inventory of the existing infrastructure and equipment of the WCWSC. Measurements from existing water and sewer system maps, reported lengths

and sizes from MDNR construction and operating permits as well as MDNR inspection reports, and information provided by the system owner were all used to prepare a detailed list of the existing infrastructure.

To estimate costs, typical cross sections of water and sewer line installation were developed to assist determine approximate quantities of excavation, pipe bedding, backfill, etc. for the various underground systems. Black & Veatch then applied unit costs for these various quantities to develop "per foot" costs for water and sewer main installation and "unit costs" for manholes, meters, and other similar types of infrastructure. Where possible, these unit costs are based upon installed costs represented in the *RS Means Building Construction Cost Data, 58th Annual Edition*. RS Means is a standard engineering industry source for cost estimating. Where costs were not available though RS Means, Black & Veatch utilized information provided by local equipment manufacturer's representatives, internet catalogues, or past project experience to develop estimated costs for the various components. As indicated in Column 1 on Page 9 of the supporting sheets, the resulting estimated Year 2000 reproduction value of the WCWSC properties totals $2,901,784.

Estimated date of original construction:

To properly account for inflation since the time of construction, Black & Veatch developed and estimated date of construction (or purchase) for each item on the inventory. Because no other data was available at the time, Black & Veatch relied upon the dates which the subdivision plats were recorded and various MDNR documentation to estimate the date of construction for the water and sewer infrastructure. By reviewing subdivision plat records in the Warren County Municipal Building, the recording dates of various subdivision plats for the Incline Village development were determined. Based upon past experience of the Black & Veatch staff, an assumption was then made that the construction of the infrastructure located within the platted area was likely constructed within 1 to 2 years of the recording date. Where possible, MDNR records including construction and operating permits and inspection reports were used to provide additional construction dates or verify the plat recording based dates.

Trending of construction costs:

Using the Year 2000 values derived for individual property groups as the starting point, a two step process was utilized by Black & Veatch to derive the estimated book value (i.e., original cost less accumulated depreciation) in the Year 2002. The first step utilizes utility construction cost indices for the Year 2000 and the approximate year each item of property was placed into service to derive each item's estimated original cost. The second step develops an allowance for the accumulated depreciation which would have occurred since each unit of property was placed into service through the year 2002, which is deducted from the estimated original cost to derive the property's estimated book value for that year.

Construction cost indices recognized for the purpose of back-trending reproduction cost to estimate each property item's original cost include the Handy-Whitman Index of Public Utility Construction Costs, Trends of Construction Costs, published by Whitman, Requardt & Associates, LLP (specifically Cost Trends of Water Utility Construction in the North Central Region), the Environmental Protection Agency's (EPA) Construction Index for Sewers and Wastewater Treatment Facilities (specifically those for the St. Louis region), and the Engineering News Record (ENR) Construction Cost Index. The Handy-Whitman indices for respective property categories and years were used for back-trending virtually all water utility property and wastewater treatment plant assets, the latter of which are similar in many respects to water treatment plant assets. The EPA indices for sewers, supplemented by ENR construction cost indices in the years subsequent to 1989 (the EPA no longer maintains its index) were used to back-trend virtually all wastewater utility property, excluding treatment facilities. [Note: The single exception to the above is a minor item of Common Facility Miscellaneous Equipment believed to be placed in service in the 1996-2000 period, which was back-trended three percent.] For use in back-trending the reproduction values established herein for each 5-year band, separate indices were derived for each such band, consisting of the average of the individual year indices included within each band

As shown in Column 5 on Page 9 of the enclosed supporting data, the resulting estimated original cost value of the properties recognized herein totals $1,600,658.

Depreciated Values:

In the absence of established service lives for the properties examined herein, estimated service lives were established for each category of property based on engineering judgment and experience involving other utilities with similar types of assets. Average service lives of 40 years were assumed for water distribution pipe and wastewater collection sewers, which comprise the major portions of the recognized plant in service. The individual property service lives and annual depreciation rates recognized herein for purposes of calculating accumulated (straight line) depreciation allowances are shown summarized in Columns 7 and 8 of the enclosed supporting sheets.

As presented in Column 10 on Page 9 of the enclosed supporting data, the estimated book value of the properties recognized herein totals $742,851.

Attachment 1
OCLD Calculation Spreadsheets

Missouri American Water Company
Warren County Water & Sewer Company
Inventory of Assests and Valuation

Item	A total Quantity	Unit	Unit Cost	Total Costs	B Math Check (C+D+E+F)	C Installation Vintage/number 71-75	D 76-80	E 81-85	F 86-90	91-95	95-2000	00-03	B Math Check (C+D+E+F)	C Installation Vintage/cost 71-75	D 76-80	E 81-85	F 86-90	91-95	95-2000	00-03
Wastewater Facilities																				
Collection system	46,188	LF	14.39	664645.3	46188	15992	16372	9999		3825			664645.32	230124.88	235593.08	143885.61	0	55041.75	0	0
8 inch PVC Sewer Line	13,435	LF	4.8	64488	13435	3141	2735	5759		1800			64488	15076.8	13128	27643.2	0	8640	0	0
Forcemains	223	EA	1785	398055	223	77	82	50		14			398055	137445	146370	89250	0	24990	0	0
4-ft. diameter, pre-cast concrete Manholes	70	EA	1500	105000	70	0		35	35				105000	0	0	52500	52500	0	0	0
Gould Simplex, Grinder Pumps, 2 ft. x 6 ft. Manhole,Discharge Piping, Valves	850	EA	276	234600	850	305	314	171		60			234600	84180	86684	47196	0	16560	0	0
Wye and Service Lateral																				
														0	0	0	0	0	0	0
Pumping Stations													20000	0	0	20000	0	0	0	0
Lift Station No 1 - Golf Course	1	EA	20,000	20000	1			1					20000	0	0	0	0	0	0	0
Lift Station No 2 - Sewer Treatment Plant No 2	1	EA	20,000	20000	1			1					20000	0	0	0	0	0	20000	0
Lift Station NO 3 - Boat Dock	1	EA	20,000	20000	1			0			1		20000	0	0	0	0	20000	0	0
Lift Station No 4 - Shady Oaks Trailer Park	1	EA	20,000	20000	1					1										
														0	0	0	0	0	0	0
Treatment facities													184000	0	0	184000	0	0	0	0
Sewer Treatment Plant No 1	1	EA	184000	184000	1			1					184000	0	0	184000	0	0	0	0
Sewer Treatment Plant No 2	1	EA	184000	184000	1			1					0	0	0	0	0	0	0	0
Property for Expansion of Sewer treatment plant No 2	0.3	ACRES		0	0.3						0.3									
														0	0	0	0	0	0	0
Miscellaneous Equipment											1		885	0	0	0	0	0	885	0
Smoke Blower and Smoke bombs	1	EA	885	885	1						1		1150	0	0	0	0	0	1150	0
Hach Dissolved Oxygen Meter	1	EA	1150	1150	1							1	0	0	0	0	0	0	0	0
5HP Envirport Blower	1	EA		0	1															
														0	0	0	0	0	0	0
Water Facilities														0	0	0	0	0	0	0
Distribution System	1,721	LF	15.27	26279.67	1721	1721							26279.67	26279.67	0	0	0	0	0	0
8 inch PVC Water mains	49,294	LF	10.32	508714.1	49294	14727	8910	18557		7100			508714.08	151982.64	91951.2	191508.24	0	73272	0	0
6 inch PVC Water Mains	5,775	LF	8.29	47874.75	5775			1775		4000			47874.75	0	0	14714.75	0	33160	0	0
4 inch PVC Water Mains	1,383	LF	4.8	6638.4	1383					1383			6638.4	0	0	0	0	6638.4	0	0
2 Inch PVC Water Mains	73	EA	730	53290	73	33	21	14		5			53290	24090	15330	10220	0	3650	0	0
6 inch Gate valve	4	EA	1075	4300	4	4							4300	4300	0	0	0	0	0	0
8 inch Gate valves	4	EA	670	2680	4					4			2680	0	0	0	0	2680	0	0
4 inch Gate valves		EA		0	0								0	0	0	0	0	0	0	0
2 Inch gate valves	393	EA	98.5	38710.5	393	65	65	65	65	65	65	3	38710.5	6402.5	6402.5	6402.5	6402.5	6402.5	6402.5	295.5
Residential Water Meter (5/8)	62	EA	1025	63550	62	22	16	14		10			63550	22550	16400	14350	0	10250	0	0
Fire Hydrants	2	EA	224	448	2					2			448	0	0	0	0	448	0	0
4 inch tee	90	EA	252	22680	90	38	26	22		4			22680	9576	6552	5544	0	1008	0	0
6 inch tee	5	EA	350	1750	5	5							1750	1750	0	0	0	0	0	0
8 inch tee	11	EA	140	1540	11					11			1540	0	0	0	0	1540	0	0
4 inch fitting	40	EA	223	8920	40	14	17	9					8920	3122	3791	2007	0	0	0	0
6 inch fitting	1	EA	315	315	1	1							315	315	0	0	0	0	0	0
8 inch fitting																				
														0	0	0	0	0	0	0
Storage Facilities	32,000	Gal	2	64000	32000			32000					64000	0	0	64000	0	0	0	0
12 ft Dia, 32,000gallon 38 foot high standpipe/ overflow	300	LF	15.45	4635	300			300					4635	0	0	4635	0	0	0	0
6 foot high barbed wire fence	200	LF	15.45	3090	200						200		3090	0	0	0	0	0	3090	0
6 foot high barbed wire fence (future tank site	0.3	ACRES		0	0.3						0.3		0	0	0	0	0	0	0	0
property for future tank site																				
														0	0	0	0	0	0	0
Water Supply	1	EA	85000	85000	1			1					85000	0	0	85000	0	0	0	0
14 Inch Well(per Brodke Drilling)												1	15000	0	0	0	0	0	0	15000
	1	EA	15000	15000	1								3075	0	0	3075	0	0	0	0
Well Pump	1	EA	3075	3075	1			1					670	0	0	670	0	0	0	0
4" Rockwell Water meter	1	LOT	670	670	1			1				1	978	0	0	0	0	0	0	978
4inch discharge piping, valves and Pressure Gage	1	EA	978	978	1															
LMI Chlorine Injection Pump														0	0	0	0	0	0	0
													9047.5	0	0	9047.5	0	0	0	0
Building	350	SF	25.85	9047.5	350			350					45	0	0	45	0	0	0	0
14 x 24 foot wood framed building with Concrete Floor	1	EA	45	45	1			1					500	0	0	0	0	500	0	0
Sink	1	EA	500	500	1					1			0	0	0	0	0	0	0	0
Refrigerator	1	EA	0	0	1				1				340	0	0	0	0	0	0	340
Freezer	1	EA	340	340	1							1	1000	0	0	0	0	0	1000	0
Time Clock	1	EA	1000	1000	1						1		0	0	0	0	0	0	0	0
Facsimile Machine	1		0	0	1			1												
Desk & Chair														0	0	0	0	0	0	0
													0	0	0	0	0	0	0	0
Miscellaneous	11	EA		0	11							11	712	0	0	0	0	0	0	712
Valve Box Lids	4	EA	178	712	4							4	338	0	0	0	0	0	0	338
6" x 6" C.I. Tees	2	EA	169	338	2							2	104	0	0	0	0	0	0	104
6", 45 Degree C.I. Elbow	1	EA	104	104	1							1	104	0	0	0	0	0	0	104
4", 45 Degree C.I. Elbow	1	EA	104	104	1							1	0	0	0	0	0	0	0	0
4", 22 Degree C.I. Elbow	3	EA		0	3							3	507	0	0	0	0	0	0	507
4", C.I. Couplings	3	EA	169	507	3							3	0	0	0	0	0	0	0	0
4" C.I. Wyes	10	EA		0	10							10	0	0	0	0	0	0	0	0
6" Mechanical Joints	10	EA		0	10							10								
8" Full-circle Repair Clamps																				
Miscellaneous Equipment	1	EA	0	0	0								0	0	0	0	0	0	0	0
1967 Dump Truck	1	EA	860	860	1						1		860	0	0	0	0	0	860	0
Schoenstead Metal Detector	1	EA	0	0	0								0	0	0	0	0	0	0	0
16 ft. Aluminum Ladder	1	EA	287	287	1						1		287	0	0	0	0	0	287	0
Hitachi Hammer Drill	1	EA	100	100	1						1		100	0	0	0	0	0	100	0
Dewalt Hand Drill	1	EA	230	230	1						1		230	0	0	0	0	0	230	0
Makita Rechargeable Drill	1	EA	165	165	1						1		165	0	0	0	0	0	165	0
Dewalt Reciprocating Saw	13	EA	69	897	13						13		897	0	0	0	0	0	897	0
Plastic Barricades	1	EA	438	438	1						1		438	0	0	0	0	0	438	0
450 Gal. Plastic Tank	1	EA	280	280	1						1		280	0	0	0	0	0	280	0
250 Gal. Plastic Tank	1	EA	2000	2000	1						1		2000	0	0	0	0	0	2000	0
RVS Billing Software	1	EA	11	11	1						1		11	0	0	0	0	0	11	0
LCI Molte Coliform Test Kit	1	EA	39	39	1						1		39	0	0	0	0	0	39	0
Hach Chlorine Test Kit	1	EA	125	125	1						1		125	0	0	0	0	0	125	0
Hach Phosphate Test Kit	1	EA	43	43	1						1		43	0	0	0	0	0	43	0
Hach Iron Test Kit	1	EA	2645	2645	1						1		2645	0	0	0	0	0	2645	0
ARB Meter Reading Gun																				
		total		2901779.22									2901779.22	717194.49	622181.76	1179693.8	58902.5	264780.7	40647.5	18378.5

Missouri American Water Company
Warren County Water & Sewer Company
Inventory of Assests and Valuation

Item	Quantities				Total	Unit Cost	Total Cost
Wastewater Facilities	Incline Village	Shady Oaks	Forest Green	Brandi Lynn			
Collection system							
8 inch PVC Sewer Line	42363	3825	0	0	46188	14.39	664645.32
2 inch PVC Forcemain	11635	1800	0	0	13435	4.8	64488
4-ft. diameter, pre-cast concrete Manholes	209	14	0	0	223	1785	398055
Gould Simplex, Grinder Pumps, 2 ft. x 6 ft. Manhole,Dischrge Piping, Valves	70	0	0	0	70	1500	105000
Wye/Service Lateral (20 lf 6 inch sewer at $12.59 and wye at $25)	790	60			850	276	234600
Pumping Stations							
Lift Station No 1 - Golf Course	1				1	20,000	20000
Lift Station No 2 - Sewer Treatment Plant No 2	1				1	20,000	20000
Lift Station NO 3 - Boat Dock	1				1	20,000	20000
Lift Station No 4 - Shady Oaks Trailer Park		1			1	20,000	20000
Treatment facities							
Sewer Treatment Plant No 1	1				1		0
Sewer Treatment Plant No 2	1				1	184000	184000
Property for Expansion of Sewer treatment plant No 2	1				1	184000	184000
Miscellaneous Equipment							
Smoke Blower and Smoke bomnbs	1				1	885	885
Hach Dissolved Oxygen Meter	1				1	1150	1150
5HP Envirport Blower	1				1		0
Water Facilities							
Distribution System							
8 inch PVC Water mains	1721	0	0	0	1721	15.27	26279.67
6 Inch PVC Water Mains	42194	0	0	7100	49294	10.32	508714.08
4 Inch PVC Water Mains	1775	4000	0	0	5775	8.29	47874.75
2 Inch PVC Water Mains	0	0	1383	0	1383	4.8	6638.4
6 Inch Gate valve	70	0	0	3	73	730	53290
8 Inch Gate valves	4	0	0	0	4	1075	4300
4 Inch Gate valves		4	0	0	4	670	2680
2 Inch gate valves		0	0	0	0		0
Residential Water Meter (5/8)	324	58	11		393	98.5	38710.5
Fire Hydrants	52	3	1	6	62	1025	63550
4 Inch tee		2			2	224	448
6 inch tee	86			4	90	252	22680
8 inch tee	5				5	350	1750
4 inch fitting		11			11	140	1540
6 inch fitting	40				40	223	8920
8 inch fitting	1				1	315	315
Storage Facilities							
12 ft Dia, 32,000gallon 38 foot high standpipe/ overflow (2 dollars per gallon)	1				32000	2	64000
6 foot high barbed wire fence					300	15.45	4635
6 foot high barbed wire fence (future tank site					200	15.45	3090
property for future tank site					0		0
Water Supply							
Well and casing	1				1	85000	85000
Well Pump	1				1	15000	15000
4" Rockwell Water meter	1				1	3075	3075
4inch discharge piping, valves and Pressure Gage	1				1	670	670
LMI Chlorine Injection Pump	1				1	978	978
Building							
14 x 24 foot wood framed building with Concrete Floor	1				350	25.85	9047.5
Sink	1				1	45	45
Refrigerator	1				1	500	500
	1				1		0
Time Clock	1				1	340	340
Facsimile Machine	1				1	1000	1000
Desk & Chair	1				1	0	0
Miscellaneous							
Valve Box Lids	11				11		0
6" x 6" C.I. Tees	4				4	178	712
6", 45 Degree C.I. Elbow	2				2	169	338
4", 45 Degree C.I. Elbow	1				1	104	104
4", 22 Degree C.I. Elbow	1				1	104	104
4", C.I. Couplings	3				3		0
4" C.I. Wyes	3				3	169	507
6" Mechanical Joints	10				10		0
8" Full-circle Repair Clamps	10				10		0
iscellaneous Equipment							
1987 Dump Truck	1				1	0	0
Schoenstead Metal Detector	1				1	860	860
16 ft. Aluminum Ladder	1				1	0	0
Hitachi Hammer Drill	1				1	287	287
Dewalt Hand Drill	1				1	100	100
Makita Rechargeable Drill	1				1	230	230
Dewalt Reciprocating Saw	1				1		0
Plastic Barricades	13				13	69	897
450 Gal. Plastic Tank	1				1	438	438
250 Gal. Plastic Tank	1				1	280	280
RVS Billing Software	1				1	2000	2000
LCI Motte Colliform Test Kit	1				1	11	11
Hach Chlorine Test Kit	1				1	39	39
Hach Phosphate Test Kit	1				1	125	125
Hach Iron Test Kit	1				1	43	43
ARB Meter Reading Gun	1				1	2645	2645
				Total Cost			2901614.22

	EPA Indices (a)				ENR Building Cost Index (b)			Handy-Whitman																	
									Water Treatment Plant										Distribution Plant						
	Collection	Treatment	Sewer Trend Factors	5-year Period Average					Collecting & Impounding Reservoirs	5-year Period Average	Structures and Improvements	5-year Period Average	Small Treatment Plant Equip.	5-year Period Average	Steel Reservoirs	5-year Period Average	Mains - Average All Types	5-year Period Average	PVC Mains	5-year Period Average	Meters	5-year Period Average	Hydrants	5-year Period Average
1970	***42***	***51***	157		836			1970	79		75		83		75		87				108		82	
1971	***48***	***58***	180		948	1.1340		1971	87		84		91		82		95				108		91	
1972	53	***64***	183		1,048	1.1055		1972	93		92		95		85		98				106		95	
1973	54	***69***	204		1,138	1.0859		1973	100		100		100		100		100				100		100	
1974	55	***73***	219		1,205	1.0589		1974	117		117		120		140		131		25		93		123	
1975	***68***	***79***	264	210	1,306	1.0838		1975	129	105	129	104	140	109	159	113	147	114	100	63	93	100	144	111
1976	74	***86***	274		1,425	1.0911		1976	131		134		152		171		154		104		98		157	
1977	***78***	***93***	289		1,545	1.0842		1977	137		141		160		172		161		107		101		165	
1978	83	***100***	307		1,654	1.0706		1978	150		155		174		173		173		113		105		182	
1979	103	***116***	347		1,919	1.1602		1979	167		169		190		178		185		122		108		195	
1980	113	***116***	386	321	1,916	0.9984		1980	185	154	184	157	208	177	191	177	202	175	132	116	122	107	207	181
1981	115	***126***	411		2,080	1.0856		1981	196		197		227		208		219		138		127		223	
1982	116	***135***	425		2,225	1.0697		1982	202		204		247		210		231		137		128		248	
1983	132	145	425		2,388	1.0733		1983	209		212		261		182		238		151		141		265	
1984	166	159	450		2,417	1.0121		1984	217		221		267		184		241		148		148		269	
1985	147	163	439	430	2,429	1.0050		1985	223	209	228	212	277	256	181	193	248	235	149	145	135	136	282	257
1986	157	175	481		2,493	1.0263		1986	230		234		283		184		245		148		135		292	
1987	162	179	485		2,525	1.0128		1987	237		240		291		196		253		158		137		304	
1988	162	181	528		2,595	1.0277		1988	240		243		294		215		259		181		142		311	
1989	166	187	534		2,623	1.0108		1989	247		259		304		223		276		220		135		326	
1990	166	187	***553***	516	2,715	1.0351		1990	248	240	259	247	312	297	221	208	280	263	208	183	178	145	344	315
1991	170	192	***557***		2,733	1.0066		1991	251		264		314		232		283		199		156		352	
1992	174	196	***578***		2,838	1.0384		1992	250		263		319		262		281		171		164		356	
1993	177	200	***624***		3,066	1.0803		1993	261		275		328		254		289		177		207		361	
1994	180	203	***634***		3,115	1.0160		1994	271		287		336		246		296		180		171		367	
1995	***179***	***202***	***630***	605	3,095	0.9936		1995	284	263	302	278	344	328	246	248	305	291	190	183	188	177	378	363
1996	***184***	***207***	***647***		3,178	1.0268		1996	291		309		352		251		308		202		210		386	
1997	***197***	***221***	***691***		3,396	1.0686		1997	299		316		362		251		314		204		197		444	
1998	***196***	***220***	***688***		3,379	0.9950		1998	303		319		378		268		320		206		197		469	
1999	***199***	***224***	***699***		3,433	1.0160		1999	311		330		389		268		334		207		197		487	
2000	***206***	***232***	***723***	690	3,553	1.0350		2000	322	305	339	323	399	376	268	261	331	321	217	207	200	200	502	458
2001	***207***	***233***	***727***		3,572	1.0053		2001	328		357		412		270		347		232		206		520	
2002	***210***	***236***	***738***		3,624	1.0146		2002	337		372		425		275		359		237		207		539	
2003	***213***	***239***	***749***		3,677	1.0146		2003	348		390		440		275		378		247		207		553	
2004	***219***	***246***	***771***					2004																	

(a) The EPA indices are no longer developed, therefore, the ENR Building Cost Index is used to estimate (trend) the EPA indices for years after 1994. Numbers in bold italics

(b) Annual average ENR Building Cost Index for 1970 through 1979 and at June for remaining years indicated.

Missouri American Water Company
Warren County Water Sewer Company
Inventory of Assets and Valuation

Description	(1) Estimated Reproduction Cost 2000	(2) Trend Indices Year in-Service	(3) Trend Indices 2000	(4) Trend Factor	(5) Estimated OC	(6) Installation Vintage	(7) Estimated Useful Life	(8) Estimated Depreciation Rate	(9) Years in Service at 2002	(10) Estimated OCLD at 2002
	$			(3) / (2)	(1) / (4)		yrs	1 / (7)	2002 - (6)	$ (5) - [(5) x (8) x (9)]
Wastewater Facilities										
COLLECTION SYSTEM										
PVC Sewer Line										
1971 - 1975	230,125	210	723	3.443	66,841	1973	40	2.50%	29	18,381
1976 - 1980	235,593	321	723	2.252	104,599	1978	40	2.50%	24	41,840
1981 - 1985	143,886	430	723	1.681	85,575	1983	40	2.50%	19	44,927
1986 - 1990	0	516	723	1.401	0	1988	40	2.50%	14	0
1991 - 1995	55,042	605	723	1.195	46,059	1993	40	2.50%	9	35,695
1996 - 2000	0	690	723	1.048	0	1998	40	2.50%	4	0
Total PVC Sewer Line	664,646				303,075					140,844
Forcemains										
1971 - 1975	15,077	210	723	3.443	4,379	1973	40	2.50%	29	1,204
1976 - 1980	13,128	321	723	2.252	5,829	1978	40	2.50%	24	2,331
1981 - 1985	27,643	430	723	1.681	16,441	1983	40	2.50%	19	8,631
1986 - 1990	0	516	723	1.401	0	1988	40	2.50%	14	0
1991 - 1995	8,640	605	723	1.195	7,230	1993	40	2.50%	9	5,603
1996 - 2000	0	690	723	1.048	0	1998	40	2.50%	4	0
Total Forcemains	64,488				33,878					17,770
4-ft. diameter, pre-cast concrete Manholes										
1971 - 1975	137,445	210	723	3.443	39,922	1973	60	1.67%	29	20,626
1976 - 1980	146,370	321	723	2.252	64,986	1978	60	1.67%	24	38,992
1981 - 1985	89,250	430	723	1.681	53,081	1983	60	1.67%	19	36,272
1986 - 1990	0	516	723	1.401	0	1988	60	1.67%	14	0
1991 - 1995	24,990	605	723	1.195	20,911	1993	60	1.67%	9	17,775
1996 - 2000	0	690	723	1.048	0	1998	60	1.67%	4	0
Total 4-ft. diameter, pre-cast concrete Manholes	398,055				178,900					113,664

Note: Due to the uncertainty of exact vintages, all plant additions after 2000, which total approximately $18,000 in reproduction costs, are included with the 1996-2000 additions in the context of this limited study.

Missouri American Water Company
Warren County Water Sewer Company
Inventory of Assets and Valuation

Description	(1) Estimated Reproduction Cost 2000	(2) Trend Indices Year in-Service	(3) Trend Indices 2000	(4) Trend Factor	(5) Estimated OC	(6) Installation Vintage	(7) Estimated Useful Life	(8) Estimated Depreciation Rate	(9) Years in Service at 2002	(10) Estimated OCLD at 2002
	$			(3) / (2)	$ (1) / (4)		yrs	1 / (7)	2002 - (6)	$ (5) - [(5) x (8) x (9)]
Gould Simplex, Grinder Pumps, 2 ft. x 6 ft. Manhole,Dischrge Piping, Valves										
1971 - 1975	0	210	723	3.443	0	1973	25	4.00%	29	0
1976 - 1980	0	321	723	2.252	0	1978	25	4.00%	24	0
1981 - 1985	52,500	430	723	1.681	31,224	1983	25	4.00%	19	7,494
1986 - 1990	52,500	516	723	1.401	37,469	1988	25	4.00%	14	16,486
1991 - 1995	0	605	723	1.195	0	1993	25	4.00%	9	0
1996 - 2000	0	690	723	1.048	0	1998	25	4.00%	4	0
Total Gould Simplex	105,000				68,693					23,980
Wye and Service Lateral										
1971 - 1975	84,180	210	723	3.443	24,451	1973	40	2.50%	29	6,724
1976 - 1980	86,664	321	723	2.252	38,477	1978	40	2.50%	24	15,391
1981 - 1985	47,196	430	723	1.681	28,070	1983	40	2.50%	19	14,737
1986 - 1990	0	516	723	1.401	0	1988	40	2.50%	14	0
1991 - 1995	16,560	605	723	1.195	13,857	1993	40	2.50%	9	10,739
1996 - 2000	0	690	723	1.048	0	1998	40	2.50%	4	0
Total Wye and Service Lateral	234,600				104,855					47,591
TOTAL COLLECTION SYSTEM	1,466,789				689,401					343,849
PUMPING STATIONS										
1971 - 1975	0	210	723	3.443	0	1973	25	4.00%	29	0
1976 - 1980	0	321	723	2.252	0	1978	25	4.00%	24	0
1981 - 1985	40,000	430	723	1.681	23,790	1983	25	4.00%	19	5,710
1986 - 1990	0	516	723	1.401	0	1988	25	4.00%	14	0
1991 - 1995	20,000	605	723	1.195	16,736	1993	25	4.00%	9	10,711
1996 - 2000	20,000	690	723	1.048	19,087	1998	25	4.00%	4	16,033
TOTAL PUMPING STATIONS	80,000				59,613					32,454

Note: Due to the uncertainty of exact vintages, all plant additions after 2000, which total approximately $18,000 in reproduction costs, are included with the 1996-2000 additions in the context of this limited study.

Missouri American Water Company
Warren County Water Sewer Company
Inventory of Assets and Valuation

Description	(1) Estimated Reproduction Cost 2000	(2) Trend Indices Year in-Service	(3) Trend Indices 2000	(4) Trend Factor	(5) Estimated OC	(6) Installation Vintage	(7) Estimated Useful Life	(8) Estimated Depreciation Rate	(9) Years in Service at 2002	(10) Estimated OCLD at 2002
	$			(3) / (2)	$ (1) / (4)		yrs	1 / (7)	2002 - (6)	$ (5) - [(5) x (8) x (9)]
TREATMENT FACILITIES										
1971 - 1975	0	109	399	3.661	0	1973	25	4.00%	29	0
1976 - 1980	0	177	399	2.254	0	1978	25	4.00%	24	0
1981 - 1985	368,000	256	399	1.559	236,110	1983	25	4.00%	19	56,666
1986 - 1990	0	297	399	1.343	0	1988	25	4.00%	14	0
1991 - 1995	0	328	399	1.216	0	1993	25	4.00%	9	0
1996 - 2000	0	376	399	1.061	0	1998	25	4.00%	4	0
TOTAL TREATMENT FACILITIES	368,000				236,110					56,666
MISCELLANEOUS EQUIPMENT										
1971 - 1975	0	210	723	3.443	0	1973	10	10.00%	29	0
1976 - 1980	0	321	723	2.252	0	1978	10	10.00%	24	0
1981 - 1985	0	430	723	1.681	0	1983	10	10.00%	19	0
1986 - 1990	0	516	723	1.401	0	1988	10	10.00%	14	0
1991 - 1995	0	605	723	1.195	0	1993	10	10.00%	9	0
1996 - 2000	2,035	690	723	1.048	1,942	1998	10	10.00%	4	1,165
TOTAL MISCELLANEOUS EQUIPMENT	2,035				1,942					1,165
TOTAL WASTEWATER FACILITIES	1,916,824				987,066					434,134

Note: Due to the uncertainty of exact vintages, all plant additions after 2000, which total approximately $18,000 in reproduction costs, are included with the 1996-2000 additions in the context of this limited study.

Missouri American Water Company
Warren County Water Sewer Company
Inventory of Assets and Valuation

Description	(1) Estimated Reproduction Cost 2000	(2) Trend Indices Year in-Service	(3) Trend Indices 2000	(4) Trend Factor	(5) Estimated OC	(6) Installation Vintage	(7) Estimated Useful Life	(8) Estimated Depreciation Rate	(9) Years in Service at 2002	(10) Estimated OCLD at 2002
	$			(3) / (2)	$ (1) / (4)		yrs	1 / (7)	2002 - (6)	$ (5) - [(5) x (8) x (9)]
Water Facilities										
DISTRIBUTION SYSTEM										
PVC Water Mains										
1971 - 1975	178,263	100	217	2.170	82,149	1973	40	2.50%	29	22,591
1976 - 1980	91,951	116	217	1.871	49,154	1978	40	2.50%	24	19,661
1981 - 1985	206,223	145	217	1.497	137,799	1983	40	2.50%	19	72,344
1986 - 1990	0	183	217	1.186	0	1988	40	2.50%	14	0
1991 - 1995	113,070	183	217	1.186	95,354	1993	40	2.50%	9	73,899
1996 - 2000	0	207	217	1.048	0	1998	40	2.50%	4	0
Total PVC Water Mains	589,507				364,455					188,496
Valves										
1971 - 1975	28,390	100	217	2.170	13,083	1973	40	2.50%	29	3,598
1976 - 1980	15,330	116	217	1.871	8,195	1978	40	2.50%	24	3,278
1981 - 1985	10,220	145	217	1.497	6,829	1983	40	2.50%	19	3,585
1986 - 1990	0	183	217	1.186	0	1988	40	2.50%	14	0
1991 - 1995	6,330	183	217	1.186	5,338	1993	40	2.50%	9	4,137
1996 - 2000	0	207	217	1.048	0	1998	40	2.50%	4	0
Total Valves	60,270				33,445					14,598
Residential Water Meters										
1971 - 1975	6,403	100	200	2.000	3,202	1973	25	4.00%	29	0
1976 - 1980	6,403	107	200	1.869	3,426	1978	25	4.00%	24	137
1981 - 1985	6,403	136	200	1.471	4,354	1983	25	4.00%	19	1,045
1986 - 1990	6,403	145	200	1.379	4,642	1988	25	4.00%	14	2,043
1991 - 1995	6,403	177	200	1.130	5,667	1993	25	4.00%	9	3,627
1996 - 2000	6,699	200	200	1.000	6,699	1998	25	4.00%	4	5,627
Total Residential Water Meters	38,714				27,989					12,478

Note: Due to the uncertainty of exact vintages, all plant additions after 2000, which total approximately $18,000 in reproduction costs, are included with the 1996-2000 additions in the context of this limited study.

Missouri American Water Company
Warren County Water Sewer Company
Inventory of Assets and Valuation

Description	(1) Estimated Reproduction Cost 2000	(2) Trend Indices Year in-Service	(3) Trend Indices 2000	(4) Trend Factor	(5) Estimated OC	(6) Installation Vintage	(7) Estimated Useful Life	(8) Estimated Depreciation Rate	(9) Years in Service at 2002	(10) Estimated OCLD at 2002
	$			(3) / (2)	$ (1) / (4)		yrs	1 / (7)	2002 - (6)	$ (5) - [(5) x (8) x (9)]
Fire Hydrants										
1971 - 1975	22,550	111	502	4.523	4,986	1973	50	2.00%	29	2,094
1976 - 1980	16,400	181	502	2.773	5,913	1978	50	2.00%	24	3,075
1981 - 1985	14,350	257	502	1.953	7,347	1983	50	2.00%	19	4,555
1986 - 1990	0	315	502	1.594	0	1988	50	2.00%	14	0
1991 - 1995	10,250	363	502	1.383	7,412	1993	50	2.00%	9	6,078
1996 - 2000	0	458	502	1.096	0	1998	50	2.00%	4	0
Total Fire Hydrants	63,550				25,658					15,802
Tees & Fittings										
1971 - 1975	14,763	100	217	2.170	6,803	1973	40	2.50%	29	1,871
1976 - 1980	10,343	116	217	1.871	5,529	1978	40	2.50%	24	2,212
1981 - 1985	7,551	145	217	1.497	5,046	1983	40	2.50%	19	2,649
1986 - 1990	0	183	217	1.186	0	1988	40	2.50%	14	0
1991 - 1995	2,996	183	217	1.186	2,527	1993	40	2.50%	9	1,958
1996 - 2000	0	207	217	1.048	0	1998	40	2.50%	4	0
Total Tees & Fittings	35,653				19,904					8,690
TOTAL DISTRIBUTION SYSTEM	787,694				471,451					240,064
STORAGE FACILITIES										
Standpipe										
1971 - 1975	0	113	268	2.372	0	1973	50	2.00%	29	0
1976 - 1980	0	177	268	1.514	0	1978	50	2.00%	24	0
1981 - 1985	64,000	193	268	1.389	46,090	1983	50	2.00%	19	28,576
1986 - 1990	0	208	268	1.288	0	1988	50	2.00%	14	0
1991 - 1995	0	248	268	1.081	0	1993	50	2.00%	9	0
1996 - 2000	0	261	268	1.027	0	1998	50	2.00%	4	0
Total Standpipe	64,000				46,090					28,576

Note: Due to the uncertainty of exact vintages, all plant additions after 2000, which total approximately $18,000 in reproduction costs, are included with the 1996-2000 additions in the context of this limited study.

Missouri American Water Company
Warren County Water Sewer Company
Inventory of Assets and Valuation

Description	(1) Estimated Reproduction Cost 2000	(2) Trend Indices Year in-Service	(3) Trend Indices 2000	(4) Trend Factor	(5) Estimated OC	(6) Installation Vintage	(7) Estimated Useful Life	(8) Estimated Depreciation Rate	(9) Years in Service at 2002	(10) Estimated OCLD at 2002
	$			(3) / (2)	$ (1) / (4)		yrs	1 / (7)	2002 - (6)	$ (5) - [(5) x (8) x (9)]
Barbed Wire Fence										
1971 - 1975	0	113	268	2.372	0	1973	20	5.00%	29	0
1976 - 1980	0	177	268	1.514	0	1978	20	5.00%	24	0
1981 - 1985	4,635	193	268	1.389	3,338	1983	20	5.00%	19	167
1986 - 1990	0	208	268	1.288	0	1988	20	5.00%	14	0
1991 - 1995	0	248	268	1.081	0	1993	20	5.00%	9	0
1996 - 2000	3,090	261	268	1.027	3,009	1998	20	5.00%	4	2,407
Total Barbed Wire Fence	7,725				6,347					2,574
TOTAL STORAGE FACILITIES	71,725				52,437					31,150
WATER SUPPLY										
Well & Pump										
1971 - 1975	0	105	322	3.067	0	1973	25	4.00%	29	0
1976 - 1980	0	154	322	2.091	0	1978	25	4.00%	24	0
1981 - 1985	85,000	209	322	1.541	55,171	1983	25	4.00%	19	13,241
1986 - 1990	0	240	322	1.342	0	1988	25	4.00%	14	0
1991 - 1995	0	263	322	1.224	0	1993	25	4.00%	9	0
1996 - 2000	15,000	305	322	1.056	14,208	1998	25	4.00%	4	11,935
Total Well & Pump	100,000				69,379					25,176
Water Meter										
1971 - 1975	0	105	322	3.067	0	1973	25	4.00%	29	0
1976 - 1980	0	154	322	2.091	0	1978	25	4.00%	24	0
1981 - 1985	3,075	209	322	1.541	1,996	1983	25	4.00%	19	479
1986 - 1990	0	240	322	1.342	0	1988	25	4.00%	14	0
1991 - 1995	0	263	322	1.224	0	1993	25	4.00%	9	0
1996 - 2000	0	305	322	1.056	0	1998	25	4.00%	4	0
Total Water Meter	3,075				1,996					479

Note: Due to the uncertainty of exact vintages, all plant additions after 2000, which total approximately $18,000 in reproduction costs, are included with the 1996-2000 additions in the context of this limited study.

Missouri American Water Company
Warren County Water Sewer Company
Inventory of Assets and Valuation

Description	(1) Estimated Reproduction Cost 2000	(2) Trend Indices Year in-Service	(3) Trend Indices 2000	(4) Trend Factor	(5) Estimated OC	(6) Installation Vintage	(7) Estimated Useful Life	(8) Estimated Depreciation Rate	(9) Years in Service at 2002	(10) Estimated OCLD at 2002
	$			(3) / (2)	$ (1) / (4)		yrs	1 / (7)	2002 - (6)	$ (5) - [(5) x (8) x (9)]
4inch discharge piping, valves and Pressure Gage										
1971 - 1975	0	105	322	3.067	0	1973	40	2.50%	29	0
1976 - 1980	0	154	322	2.091	0	1978	40	2.50%	24	0
1981 - 1985	670	209	322	1.541	435	1983	40	2.50%	19	228
1986 - 1990	0	240	322	1.342	0	1988	40	2.50%	14	0
1991 - 1995	0	263	322	1.224	0	1993	40	2.50%	9	0
1996 - 2000	0	305	322	1.056	0	1998	40	2.50%	4	0
Total Discharge Piping, Valves & Pressure Gage	670				435					228
LMI Chlorine Injection Pump										
1971 - 1975	0	105	322	3.067	0	1973	20	5.00%	29	0
1976 - 1980	0	154	322	2.091	0	1978	20	5.00%	24	0
1981 - 1985	0	209	322	1.541	0	1983	20	5.00%	19	0
1986 - 1990	0	240	322	1.342	0	1988	20	5.00%	14	0
1991 - 1995	0	263	322	1.224	0	1993	20	5.00%	9	0
1996 - 2000	978	305	322	1.056	926	1998	20	5.00%	4	741
Total LMI Chlorine Injection Pump	978				926					741
TOTAL WATER SUPPLY	104,723				72,736					26,624
BUILDING										
14 x 24 foot wood framed building with Concrete Floor										
1971 - 1975	0	104	339	3.260	0	1973	50	2.00%	29	0
1976 - 1980	0	157	339	2.159	0	1978	50	2.00%	24	0
1981 - 1985	9,048	212	339	1.599	5,658	1983	50	2.00%	19	3,508
1986 - 1990	0	247	339	1.372	0	1988	50	2.00%	14	0
1991 - 1995	0	278	339	1.219	0	1993	50	2.00%	9	0
1996 - 2000	0	323	339	1.050	0	1998	50	2.00%	4	0
Total Wood Framed Building	9,048				5,658					3,508

Note: Due to the uncertainty of exact vintages, all plant additions after 2000, which total approximately $18,000 in reproduction costs, are included with the 1996-2000 additions in the context of this limited study.

Missouri American Water Company
Warren County Water Sewer Company
Inventory of Assets and Valuation

Description	(1) Estimated Reproduction Cost 2000	(2) Trend Indices Year in-Service	(3) Trend Indices 2000	(4) Trend Factor	(5) Estimated OC	(6) Installation Vintage	(7) Estimated Useful Life	(8) Estimated Depreciation Rate	(9) Years in Service at 2002	(10) Estimated OCLD at 2002
	$			(3) / (2)	$ (1) / (4)		yrs	1 / (7)	2002 - (6)	$ (5) - [(5) x (8) x (9)]
Sink, Refrigerator, Freezer										
1971 - 1975	0	104	339	3.260	0	1973	25	4.00%	29	0
1976 - 1980	0	157	339	2.159	0	1978	25	4.00%	24	0
1981 - 1985	45	212	339	1.599	28	1983	25	4.00%	19	7
1986 - 1990	0	247	339	1.372	0	1988	25	4.00%	14	0
1991 - 1995	500	278	339	1.219	410	1993	25	4.00%	9	262
1996 - 2000	0	323	339	1.050	0	1998	25	4.00%	4	0
Total Sink, Refrigerator, Freezer	545				438					269
Time Clock										
1971 - 1975	0	104	339	3.260	0	1973	20	5.00%	29	0
1976 - 1980	0	157	339	2.159	0	1978	20	5.00%	24	0
1981 - 1985	0	212	339	1.599	0	1983	20	5.00%	19	0
1986 - 1990	0	247	339	1.372	0	1988	20	5.00%	14	0
1991 - 1995	0	278	339	1.219	0	1993	20	5.00%	9	0
1996 - 2000	340	323	339	1.050	324	1998	20	5.00%	4	259
Total Time Clock	340				324					259
Facsimile Machine, Desk, & Chair										
1971 - 1975	0	104	339	3.260	0	1973	10	10.00%	29	0
1976 - 1980	0	157	339	2.159	0	1978	10	10.00%	24	0
1981 - 1985	0	212	339	1.599	0	1983	10	10.00%	19	0
1986 - 1990	0	247	339	1.372	0	1988	10	10.00%	14	0
1991 - 1995	0	278	339	1.219	0	1993	10	10.00%	9	0
1996 - 2000	1,000	323	339	1.050	953	1998	10	10.00%	4	572
Total Facsimile Machine, Desk, & Chair	1,000				953					572
TOTAL BUILDING	10,933				7,373					4,608
MISCELLANEOUS										
1971 - 1975	0	114	331	2.904	0	1973	40	2.50%	29	0
1976 - 1980	0	175	331	1.891	0	1978	40	2.50%	24	0
1981 - 1985	0	235	331	1.409	0	1983	40	2.50%	19	0
1986 - 1990	0	263	331	1.259	0	1988	40	2.50%	14	0
1991 - 1995	0	291	331	1.137	0	1993	40	2.50%	9	0
1996 - 2000	1,765	321	331	1.031	1,712	1998	40	2.50%	4	1,541
TOTAL MISCELLANEOUS	1,765				1,712					1,541
TOTAL WATER FACILITIES	976,840				605,709					303,986

Note: Due to the uncertainty of exact vintages, all plant additions after 2000, which total approximately $18,000 in reproduction costs, are included with the 1996-2000 additions in the context of this limited study.

Missouri American Water Company
Warren County Water Sewer Company
Inventory of Assets and Valuation

Description	(1) Estimated Reproduction Cost 2000	(2) Trend Indices Year in-Service	(3) Trend Indices 2000	(4) Trend Factor	(5) Estimated OC	(6) Installation Vintage	(7) Estimated Useful Life	(8) Estimated Depreciation Rate	(9) Years in Service at 2002	(10) Estimated OCLD at 2002
	$			(3) / (2)	$ (1) / (4)		yrs	1 / (7)	2002 - (6)	$ (5) - [(5) x (8) x (9)]
Common Facilities										
1967 Dump Truck										
1971 - 1975	0			1.030	0	1973	5	20.00%	29	0
1976 - 1980	0			1.030	0	1978	5	20.00%	24	0
1981 - 1985	0			1.030	0	1983	5	20.00%	19	0
1986 - 1990	0			1.030	0	1988	5	20.00%	14	0
1991 - 1995	0			1.030	0	1993	5	20.00%	9	0
1996 - 2000	0			1.030	0	1998	5	20.00%	4	0
Total 1967 Dump Truck	0				0					0
Miscellaneous Equipment										
1971 - 1975	0			1.030	0	1973	10	10.00%	29	0
1976 - 1980	0			1.030	0	1978	10	10.00%	24	0
1981 - 1985	0			1.030	0	1983	10	10.00%	19	0
1986 - 1990	0			1.030	0	1988	10	10.00%	14	0
1991 - 1995	0			1.030	0	1993	10	10.00%	9	0
1996 - 2000	8,120			1.030	7,883	1998	10	10.00%	4	4,730
Total Miscellaneous Equipment	8,120				7,883					4,730
TOTAL COMMON FACILITIES	8,120				7,883					4,730
TOTAL SYSTEM	2,901,784				1,600,658					742,851

Note: Due to the uncertainty of exact vintages, all plant additions after 2000, which total approximately $18,000 in reproduction costs, are included with the 1996-2000 additions in the context of this limited study.

	EPA Indices (a)				ENR Building Cost Index (b)	
	Collection	Treatment	Sewer Trend Factors	5-year Period Average		
1970	***42***	***51***	157		836	
1971	***48***	***58***	180		948	1.1340
1972	53	***64***	183		1,048	1.1055
1973	54	***69***	204		1,138	1.0859
1974	55	***73***	219		1,205	1.0589
1975	***68***	***79***	264	210	1,306	1.0838
1976	74	***86***	274		1,425	1.0911
1977	***78***	***93***	289		1,545	1.0842
1978	83	***100***	307		1,654	1.0706
1979	103	***116***	347		1,919	1.1602
1980	113	***116***	386	321	1,916	0.9984
1981	115	***126***	411		2,080	1.0856
1982	116	***135***	425		2,225	1.0697
1983	132	145	425		2,388	1.0733
1984	166	159	450		2,417	1.0121
1985	147	163	439	430	2,429	1.0050
1986	157	175	481		2,493	1.0263
1987	162	179	485		2,525	1.0128
1988	162	181	528		2,595	1.0277
1989	166	187	534		2,623	1.0108
1990	166	187	***553***	516	2,715	1.0351
1991	170	192	***557***		2,733	1.0066
1992	174	196	***578***		2,838	1.0384
1993	177	200	***624***		3,066	1.0803
1994	180	203	***634***		3,115	1.0160
1995	***179***	***202***	***630***	605	3,095	0.9936
1996	***184***	***207***	***647***		3,178	1.0268
1997	***197***	***221***	***691***		3,396	1.0686
1998	***196***	***220***	***688***		3,379	0.9950
1999	***199***	***224***	***699***		3,433	1.0160
2000	***206***	***232***	***723***	690	3,553	1.0350
2001	***207***	***233***	***727***		3,572	1.0053
2002	***210***	***236***	***738***		3,624	1.0146
2003	***213***	***239***	***749***		3,677	1.0146
2004	***219***	***246***	***771***			

(a) The EPA indices are no longer developed, therefore, the ENR Building Cost Index is used to estimate (trend) the EPA indices for years after 1994. Numbers in bold
(b) Annual average ENR Building Cost Index for 1970 through 1979 and at June for remaining years indicated.

	Handy-Whitman															
			Water Treatment Plant						Distribution Plant							
	Collecting & Impounding Reservoirs	5-year Period Average	Structures and Improvements	5-year Period Average	Small Treatment Plant Equip.	5-year Period Average	Steel Reservoirs	5-year Period Average	Mains - Average All Types	5-year Period Average	PVC Mains	5-year Period Average	Meters	5-year Period Average	Hydrants	5-year Period Average
1970	79		75		83		75		87				108		82	
1971	87		84		91		82		95				108		91	
1972	93		92		95		85		98				106		95	
1973	100		100		100		100		100				100		100	
1974	117		117		120		140		131		25		93		123	
1975	129	105	129	104	140	109	159	113	147	114	100	63	93	100	144	111
1976	131		134		152		171		154		104		98		157	
1977	137		141		160		172		161		107		101		165	
1978	150		155		174		173		173		113		105		182	
1979	167		169		190		178		185		122		109		195	
1980	185	154	184	157	208	177	191	177	202	175	132	116	122	107	207	181
1981	196		197		227		208		219		138		127		223	
1982	202		204		247		210		231		137		128		248	
1983	209		212		261		182		238		151		141		265	
1984	217		221		267		184		241		148		148		269	
1985	223	209	228	212	277	256	181	193	248	235	149	145	135	136	282	257
1986	230		234		283		184		245		148		135		292	
1987	237		240		291		196		253		158		137		304	
1988	240		249		294		215		259		181		142		311	
1989	247		259		304		223		276		220		135		326	
1990	248	240	259	247	312	297	221	208	280	263	208	183	178	145	344	315
1991	251		264		314		232		283		199		156		352	
1992	250		263		319		262		281		171		164		356	
1993	261		275		328		254		289		177		207		361	
1994	271		287		336		246		296		180		171		367	
1995	284	263	302	278	344	328	246	248	305	291	190	183	188	177	378	363
1996	291		309		352		251		308		202		210		386	
1997	299		316		362		251		314		204		197		444	
1998	303		319		378		268		320		206		197		469	
1999	311		330		389		268		334		207		197		487	
2000	322	305	339	323	399	376	268	261	331	321	217	207	200	200	502	458
2001	328		357		412		270		347		232		206		520	
2002	337		372		425		275		359		237		207		539	
2003	348		390		440		275		378		247		207		553	
2004																

Attachment 2
Cost Estimate Cross Sections and Calculations

BLACK & VEATCH

Owner Missouri-American Water Company — Computed By JM

Plant Warren County Water & Sewer — Unit ____ — Date ____ 20 ____

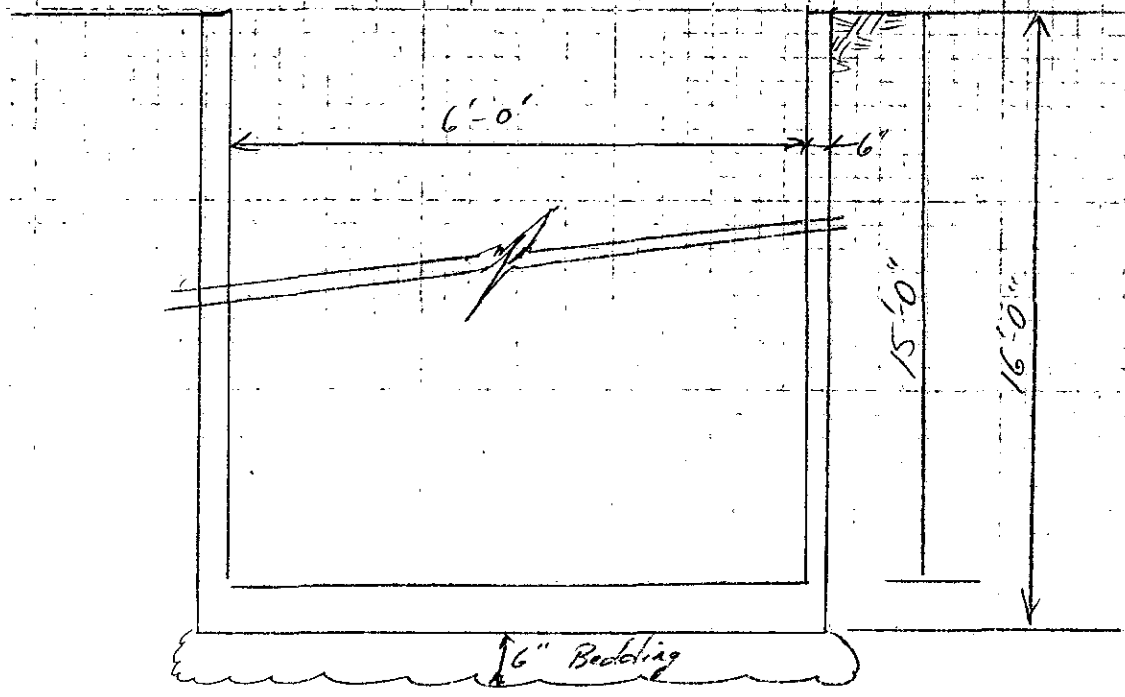
Project No. ____ — File No. ____ — Verified By ____

Title Pump Station Cost Estimates — Date ____ 20 ____

Page 1 of 2

Pump stations include 6' diameter precast wet well, 2 rail mounted 5 hp submersible pumps, control panel, 2 check valve.

Approximate depth of wet wells 15'



DO NOT WRITE IN THIS SPACE

PGN-173B

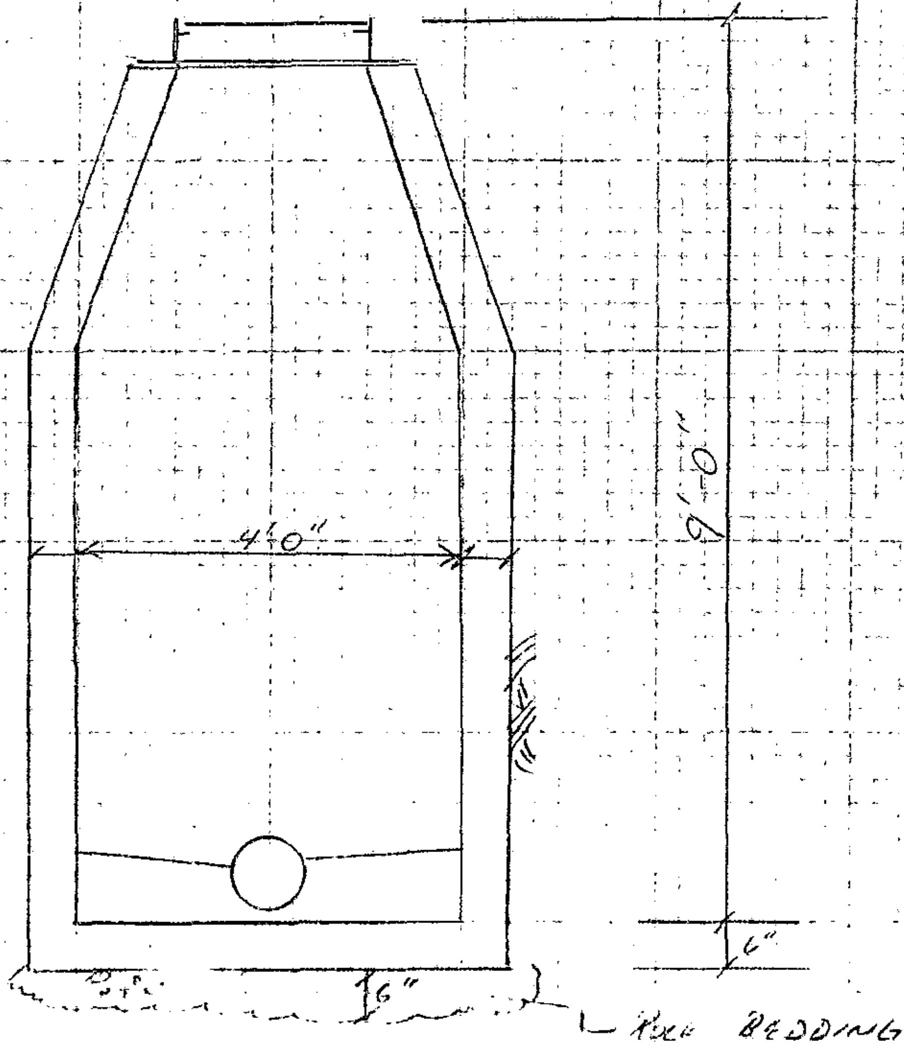
REVISED, SUPERSEDED, AND VOID CALCULATIONS MUST BE CLEARLY IDENTIFIED, INITIALED, AND DATED BY THE RESPONSIBLE INDIVIDUAL.

BLACK & VEATCH

Owner Missouri-American Water Co. Computed By [illegible]
Plant Warren Co. Water & Sewer Unit Date Nov. 6 20 03
Project No. File No. Verified By
Title Original Cost Development Date 20
Sewer Installation Cross Sections Page 2 of 10

DO NOT WRITE IN THIS SPACE

PGN-173B



SANITARY MANHOLE
TYPICAL INSTALLATION SECTION

Quantities for Manhole

[illegible] x 10' DEEP = 360 FT³ = 13.3 YD³
[illegible] (NO COMPACTION) = 18 FT³ = .66 YD³
[illegible]

REVISED, SUPERSEDED, AND VOID CALCULATIONS MUST BE CLEARLY IDENTIFIED, INITIALED, AND DATED BY THE RESPONSIBLE INDIVIDUAL.

BLACK & VEATCH

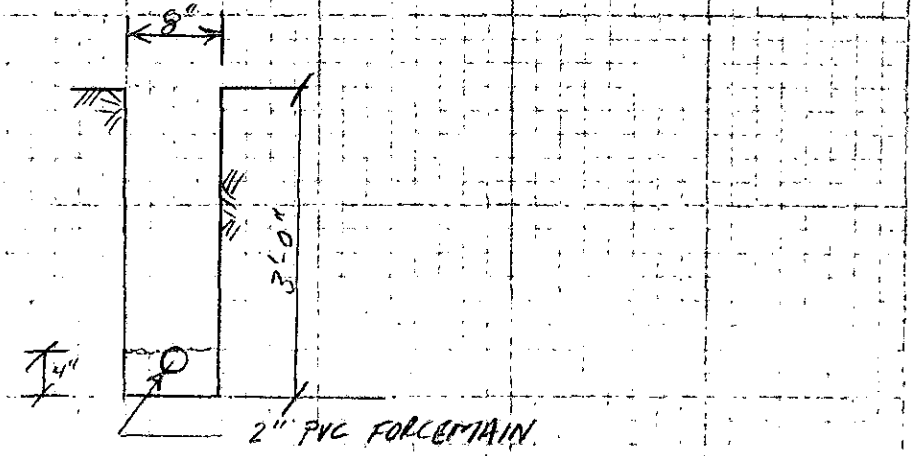
Owner Missouri-American Water Co. Computed By JR
Plant Warren County Water & Sewer Unit ____ Date Nov. 6 20 03
Project No. ____ File No. ____ Verified By ____
Title Original Cost Development Date ____ 20 ____
Force main installation cross section Page 3 of 10

DO NOT WRITE IN THIS SPACE

PGN-173B

Assumptions:

Average FM depth approximately 3'
All FM is 2" PVC
PIPE INSTALLED PER TYPICAL MODOT REQUIREMENTS
BACKFILL IS NATIVE SOILS
PIPE INSTALLED WITH TRENCHER



Quantities per foot of forcemain

EXCAVATION .66 FT x 3 FT = 1.98 FT³/FT

BEDDING .33 x .66 = 0.22 FT³/FT

BACKFILL .66 FT x 2.66 FT = 1.75 FT³/FT

REVISED, SUPERSEDED, AND VOID CALCULATIONS MUST BE CLEARLY IDENTIFIED, INITIALED, AND DATED BY THE RESPONSIBLE INDIVIDUAL

BLACK & VEATCH

Owner Missouri-American Water Company | Computed By JMK
Plant Warren County Water & Sewer Unit | Date Nov. 6 20 03
Project No. | File No. | Verified By
Title Original Cost Development | Date 20
Water Main installation cross section | Page 4 of 10

DO NOT WRITE IN THIS SPACE

PGN-173B

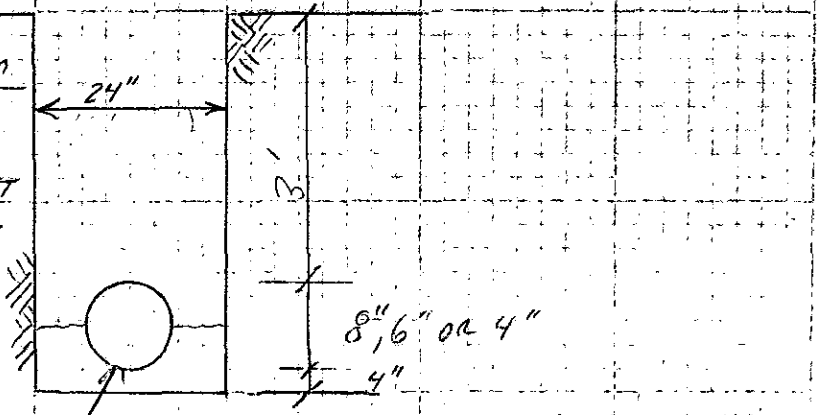
Assumptions

Average water main depth 3'

Water main materials PVC

PIPE INSTALLED PER TYPICAL MO DNR REQUIREMENTS

Backfill is native soils



8", 6", OR 4" PVC WATER MAIN

(2" WATER MAINS INSTALLED BY TRENCHER)

Quantities per foot of 8" main

Excavation 2'x4' = 8FT³/FT

BEDDING 2'x.66' = 1.32 FT³/FT

BACKFILL ≈ 6.5 FT³/FT

Quantities per foot of 6" main

Excavation 2'x3.83' = 7.66 FT³/FT

BEDDING 2'x.58' = 1.16 FT³/FT

BACKFILL ≈ 6.5 FT³/FT

Quantities per foot of 4" main

Excavation 2'x 3.66' = 7.32 FT³/FT

BEDDING 2'x.5' = 1 FT³/FT

BACKFILL ≈ 6.32 FT³/FT

Quantities per foot of 2" main (SAME AS 2" FORCEMAIN)

Excavation 1.98 FT³/FT

Bedding .22 FT³/FT

Backfill 1.75 FT³/FT

REVISED, SUPERSEDED, AND VOID CALCULATIONS MUST BE CLEARLY IDENTIFIED, INITIALED, AND DATED BY THE RESPONSIBLE INDIVIDUAL

Cost per L.F. of installation of 2" sewer Forcemain:

(Cost to include pipe, excavation, bedding, and backfill.)

Quantities per L.F.:

$$\text{Excavation} = \left(1.98\ \frac{ft^3}{ft}\right)\left(\frac{1\ yd^3}{27\ ft^3}\right) = 0.07\ \frac{yd^3}{ft}$$

$$\text{Bedding} = \left(0.22\ \frac{ft^3}{ft}\right)\left(\frac{1\ yd^3}{27\ ft^3}\right) = 0.008\ \frac{yd^3}{ft}$$

$$\text{Backfill} = \left(1.75\ \frac{ft^3}{ft}\right)\left(\frac{1\ yd^3}{27\ ft^3}\right) = 0.06\ \frac{yd^3}{ft}$$

Costs:

Excavation = $5.70/yd³

Bedding = $14.55/yd³

Backfill = $1.15/yd³

2" forcemain = $4.21/ft

$$\text{Total} = \left[\left(0.07\ \frac{yd^3}{ft}\right)\left(\frac{\$5.70}{yd^3}\right)\right] + \left[\left(0.008\ \frac{yd^3}{ft}\right)\left(\frac{\$14.55}{yd^3}\right)\right] + \left[\left(0.06\ \frac{yd^3}{ft}\right)\left(\frac{\$1.15}{yd^3}\right)\right] + \frac{\$4.21}{ft} = \boxed{\$4.80/L.f.}$$

- excavation - - bedding - - backfill - - pipe -

* Calculations do not include compaction of the bedding.

Excavation Required = 13.3 yd^3 per manhole

Bedding Required = 0.66 yd^3 per manhole

Depth = average 9 ft per manhole

Based on RSMeans Building Construction Cost Data, 2000:

Excavation = $5.20 per yd^3

Bedding = $14.55 per yd^3

Ea. Manhole = $1,427 (PRECAST STRUCTURE)

Ea. Manhole Frame & Cover = $280

Total Cost per manhole:

$$\left[\left(\frac{\$5.20}{yd^3}\right)(13.3\,yd^3)\right] + \left[\left(\frac{\$14.55}{yd^3}\right)(0.66\,yd^3)\right] + \$1{,}427 + \$280 = \boxed{\$1{,}785.76}$$

(excavation) (bedding) (manhole) (frame & cover)

* Calculations do not include back-fill of the excavation.

DO NOT WRITE IN THIS SPACE

PGN-173B

Cost per L.F of installation of 2" water main:

Same calculations as 2" sewer force main.

$4.80/L.F.

Cost per L.F. of installation of 4" water main:

(Cost to include pipe, excavation, bedding, and backfill)

Quantities per L.F.:

$$\text{Excavation} = \left(7.32\ \frac{ft^3}{ft}\right)\left(\frac{1\ yd^3}{27\ ft^3}\right) = 0.27\ \frac{yd^3}{ft}$$

$$\text{Bedding} = \left(1\ \frac{ft^3}{ft}\right)\left(\frac{1\ yd^3}{27\ ft^3}\right) = 0.04\ \frac{yd^3}{ft}$$

$$\text{Backfill} = \left(6.32\ \frac{ft^3}{ft}\right)\left(\frac{1\ yd^3}{27\ ft^3}\right) = 0.23\ \frac{yd^3}{ft}$$

Costs:

Excavation = $5.20/yd³

Bedding = $14.55/yd³

Backfill = $1.15/yd³

4" PVC = $6.05/ft.

Total:

$$\left[\left(0.27\ \frac{yd^3}{ft}\right)\left(\frac{\$5.20}{yd^3}\right)\right] + \left[\left(0.04\ \frac{yd^3}{ft}\right)\left(\frac{\$14.55}{yd^3}\right)\right] + \left[\left(0.23\ \frac{yd^3}{ft}\right)\left(\frac{\$1.15}{yd^3}\right)\right] + \frac{\$6.05}{ft} = \$8.29/L.$$

-excavation- -bedding- -backfill- -pipe-

* Calculations do not include compaction of the bedding.

Cost per L.F. of installation of 6" water main:

(cost to include pipe, excavation, bedding, and backfill).

Quantities per L.F.:

$$\text{Excavation} = \left(\frac{7.66\ ft^3}{ft}\right)\left(\frac{1\ yd^3}{27\ ft^3}\right) = \frac{0.28\ yd^3}{ft}$$

$$\text{Bedding} = \left(\frac{1.16\ ft^3}{ft}\right)\left(\frac{1\ yd^3}{27\ ft^3}\right) = \frac{0.04\ yd^3}{ft}$$

$$\text{Backfill} = \left(\frac{6.5\ ft^3}{ft}\right)\left(\frac{1\ yd^3}{27\ ft^3}\right) = \frac{0.24\ yd^3}{ft}$$

Costs:

Excavation = $5.20/yd³

Bedding = $14.55/yd³

Backfill = $1.15/yd³

6" PVC = $8.00/ft.

Total:

$$\left[\left(\frac{0.28\ yd^3}{ft}\right)\left(\frac{\$5.20}{yd^3}\right)\right] + \left[\left(\frac{0.04\ yd^3}{ft}\right)\left(\frac{\$14.55}{yd^3}\right)\right] + \left[\left(\frac{0.24\ yd^3}{ft}\right)\left(\frac{\$1.15}{yd^3}\right)\right] + \$8.00/ft. = \boxed{\$10.3\ \text{per L.F.}}$$

(excavation) (bedding) (backfill) (pipe)

* Calculations do not include compaction of bedding.

DO NOT WRITE IN THIS SPACE

PGN-173B

BLACK & VEATCH

Owner MAWC — Computed By JK & JDM
Plant Warren Co. Water & Sewer Unit — Date 11-7 20 03
Project No. — File No. — Verified By
Title Original Cost Development — Date — 20
Water Main installation cost — Page 10 of 10

Cost per L.F. of installation of 8" water main:
(cost to include pipe, excavation, bedding, and backfill).

Quantities per L.F.:

$$\text{Excavation} = \left(\frac{8\,ft^3}{ft}\right)\left(\frac{1\,yd^3}{27\,ft^3}\right) = 0.30\,\frac{yd^3}{ft}$$

$$\text{Bedding} = \left(\frac{1.32\,ft^3}{ft}\right)\left(\frac{1\,yd^3}{27\,ft^3}\right) = 0.05\,\frac{yd^3}{ft}$$

$$\text{Backfill} = \left(\frac{6.5\,ft^3}{ft}\right)\left(\frac{1\,yd^3}{27\,ft^3}\right) = 0.24\,\frac{yd^3}{ft}$$

Costs:

Excavation = $5.20/yd³
Bedding = $14.55/yd³
Backfill = $1.15/yd³
8" PVC = $12.70/ft.

Total:

$$\left[\left(\frac{0.30\,yd^3}{ft}\right)\left(\frac{\$5.20}{yd^3}\right)\right] + \left[\left(\frac{0.05\,yd^3}{ft}\right)\left(\frac{\$14.55}{yd^3}\right)\right] + \left[\left(\frac{0.24\,yd^3}{ft}\right)\left(\frac{\$1.15}{yd^3}\right)\right] + \frac{\$12.70}{ft} = \boxed{\$15.27 \text{ per L.F.}}$$

(excavation) (bedding) (backfill) (pipe)

*Calculations do not include compaction of the bedding.

DO NOT WRITE IN THIS SPACE

PGN-173B

BLACK & VEATCH

Owner Missouri-American Water Company — Computed By [illegible]
Plant Warren County Water & Sewer — Unit ____ — Date ____ 20__
Project No. ____ — File No. ____ — Verified By ____
Title s — Date ____ 20__
DATE OF INSTALLATION — Page 1 of 3

DO NOT WRITE IN THIS SPACE

PGN-173B

INCLINE VILLAGE

Based upon the year each subdivision plat was recorded - it was assumed that construction of the facilities followed within one to two years. Specific dates for some facilities were obtained from MDNR operating permits, construction permits, or inspection reports.

PLATS 1-6 - RECORDED 1974

Approximate Quantities

WATER		SEWER	
8"	1721	8"	15992
6"	14727	2"	3141
VALVES	37	WYES	305
HYDRANTS	22	MANHOLES	77
FITTINGS	15		
TEES	43 (5@8")		

BLACK & VEATCH

Owner Missouri-American Water Co. Computed By JK
Plant Warren County Water & Sewer Unit ____ Date ____ 20____
Project No. ____ File No. ____ Verified By ____
Title ____ Date ____ 20____
DATE OF INSTALLATION Page 2 of 3

DO NOT WRITE IN THIS SPACE

PGN-173B

PLATS 7-15, 19, 20 RECORDED 1977/1978

Approximate Quantities

WATER		SEWER	
8"	—	8"	16372
6"	8910	2"	2735
VALVES	21	WYES	314
HYDRANTS	16	MANHOLES	82
FITTINGS	17		
TEES	26		

REMAINING PLATS RECORDED 1981/1982

WATER		SEWER	
4"	1775	8"	9999
6"	18557	2"	5759
VALVES	14	WYES	171
HYDRANTS	14	MANHOLES	50
FITTINGS	9		
TEES	22		

Waste Water Plants

Plant #1 1981
Plant #2 1982

Pump Stations

Plant #1 1981 SHADY OAK 1994
Plant #2 1982
Boat Dock 1997

REVISED, SUPERSEDED, AND VOID CALCULATIONS MUST BE CLEARLY IDENTIFIED, INITIALED, AND DATED BY THE RESPONSIBLE INDIVIDUAL

BLACK & VEATCH

Owner Missouri-American Water Company — Computed By

Plant Warren County Water & Sewer Unit — Date — 20

Project No. — File No. — Verified By

Title — Date — 20

DATE OF INSTALLATION — Page 3 of 3

DO NOT WRITE IN THIS SPACE

PGN-173B

SHADY OAKS

MDNR CONSTRUCTION PERMIT
INDICATES 1994/1995 TIME

WATER

4000 LF 4" WATER
4- 4" VALVES
3 - FIRE HYDRANTS
2 TEES 9 FITTINGS

SEWER

3825 LF 8" SEWER
14 MANHOLES
1 LIFT STATION
1800 LF 2" FM

BRANDI LYNN

CONSTRUCTION DATE ESTIMATED 1990-1995

WATER

7100 LF 6" WATER
4 — TEES
3 - HYDRANTS
5 - VALVES

FOREST GREEN 1993 CONSTRUCTION

1382 LF 2" WATER
1- TEE
1- VALVE

WELL

1981 WELL / BLDG / STANDPIPE
2002 NEW WELL PUMP

REVISED, SUPERSEDED, AND VOID CALCULATIONS MUST BE CLEARLY IDENTIFIED, INITIALED, AND DATED BY THE RESPONSIBLE INDIVIDUAL

Attachment 3
RS Means and Related Cost Data

BLACK & VEATCH

Owner Missouri-American Water Company Computed By JDM
Plant Warren Co. Water & Sewer Unit ____ Date 11-7 20 03
Project No. ____ File No. ____ Verified By ____
Title Original Cost Development Date ____ 20 ____
Prices - RS Means Catalog Page ____ of ____

DO NOT WRITE IN THIS SPACE

Section/ Page No.	Item	Unit Cost (w/ Overhead & Profit)
020-1	Fire hydrant (3' depth)	$1,025 ea.
023-1	Backfill - dozer	$1.15/CY
023-2	Bedding - noncompacted	$14.55/CY
023-6	Excavation (1'-4' deep)	$5.70/CY
023-6	Excavation (6'-10' deep)	$5.20/CY
025-1	2" PVC water main	$4.21/LF
025-1	4" PVC water main	$6.05/LF
025-1	6" PVC water main	$8.00/LF
025-1	8" PVC water main	$12.70/LF
025-1	4" wye	$224 ea.
025-1	6" wye - sewer lines	$252 ea.
025-1	4" 45° elbow & 22° elbow (Material only, no labor, etc.)	$104 ea.
025-1	6" 45° elbow & 22° elbow (Material only, no labor, etc.)	$169 ea.
025-1	8" 45° elbow & 22° elbow (Material only, no labor, etc.)	$245 ea.
025-1	2" PVC sewer main	$4.21/LF
025-2	Wastewater plant - 50,000 GPD	$184,000 ea.
025-4	8" PVC sewer	$7.65/LF
026-3	Precast 4' ϕ Manhole (9' deep)	$1,427 ea.
026-3	Manhole frame & cover (light traffic)	$280 ea.
028-3	Chain Link Fence (6' high)	$15.45/LF
151-12	Water meter, 1" (used $3,075 ea.)	$5,450 ea.
151-12	Residential meter, 5/8"	$98.50 ea.
154-1	Sink (single heavy fixture)	$405 ea.
171-8	Wood framed building	$25.85/SF

PGN-173B

REVISED, SUPERSEDED, AND VOID CALCULATIONS MUST BE CLEARLY IDENTIFIED, INITIALED, AND DATED BY THE RESPONSIBLE INDIVIDUAL

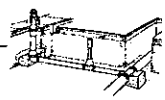
City Cost Indexes

DIVISION		MISSOURI															
		COLUMBIA			FLAT RIVER			HANNIBAL			HARRISONVILLE			JEFFERSON CITY			JOPLIN		
		652			636			634			647			650 - 651			648		
		MAT.	INST.	TOTAL	MAT.	INST.	TOTAL	MAT.	INST.	TOTAL	MAT.	INST.	TOTAL	MAT.	INST.	TOTAL	MAT.	INST.	TOT
02	SITE CONSTRUCTION	98.1	94.9	95.7	99.1	93.5	94.8	93.1	93.4	93.3	90.0	91.4	91.1	100.3	95.0	96.2	98.1	96.4	96.
03100	CONCRETE FORMS & ACCESSORIES	85.6	64.6	67.6	103.4	86.1	88.6	92.3	85.5	86.5	86.9	82.3	83.0	104.1	71.3	76.0	105.1	60.9	67.
03200	CONCRETE REINFORCEMENT	97.7	95.0	96.1	100.0	99.0	99.4	98.3	93.6	95.6	98.2	86.4	91.5	96.5	105.1	101.3	101.7	76.3	87.3
03300	CAST-IN-PLACE CONCRETE	85.8	74.3	81.0	91.3	93.8	92.3	83.6	93.1	87.6	97.0	85.7	92.3	89.8	77.9	84.8	102.6	75.4	91.3
03	CONCRETE	80.3	76.1	78.1	88.7	92.9	90.8	82.2	91.4	86.8	93.2	85.3	89.2	84.2	82.1	83.1	96.7	70.5	83.5
04	MASONRY	131.1	67.9	91.7	116.4	84.4	96.4	110.9	87.3	96.2	98.3	80.3	87.1	91.9	67.9	76.9	94.6	63.7	75.4
05	METALS	94.1	115.8	101.9	94.6	118.7	103.2	94.7	116.5	102.5	93.2	100.2	95.7	93.3	120.3	103.0	97.0	95.1	96.3
06	WOOD & PLASTICS	88.6	60.0	73.8	104.9	86.5	95.4	92.8	86.5	89.5	85.7	81.9	83.7	108.6	68.3	87.8	103.7	58.1	80.1
07	THERMAL & MOISTURE PROTECTION	91.7	73.4	83.2	92.2	87.8	90.1	91.7	85.7	88.9	96.7	84.7	91.1	92.0	74.7	83.9	98.4	68.3	84.3
08	DOORS & WINDOWS	93.8	81.4	90.7	97.9	89.0	95.7	97.9	87.5	95.4	93.4	82.4	90.7	90.4	88.6	89.9	94.2	71.9	88.8
09200	PLASTER & GYPSUM BOARD	103.9	58.4	75.7	104.8	85.7	92.9	100.7	85.7	91.4	100.4	81.0	88.4	109.9	66.9	83.3	112.0	56.4	77.6
09500	CEILINGS	90.9	58.4	69.6	92.5	85.7	88.0	92.5	85.7	88.0	94.3	81.0	85.6	90.9	66.9	75.1	97.1	56.4	70.4
09600	FLOORING	108.0	66.2	97.8	107.5	92.6	103.9	102.7	92.6	100.3	90.1	86.1	89.1	115.7	66.2	103.6	118.0	62.3	104.4
09900	PAINTS & COATINGS	95.3	66.0	78.2	95.6	93.3	94.3	95.6	100.5	98.5	95.9	87.6	91.1	95.3	66.0	78.2	90.9	55.1	70.0
09	FINISHES	94.5	63.0	78.4	96.3	87.6	91.9	93.9	88.2	91.0	94.0	83.5	88.7	98.0	67.8	82.6	103.6	59.5	81.0
10 - 14	TOTAL DIV. 10000 - 14000	100.0	94.0	98.7	100.0	84.0	96.6	100.0	83.4	96.5	100.0	87.7	97.4	100.0	95.1	99.0	100.0	82.0	96.2
15	MECHANICAL	100.2	72.9	87.8	96.9	96.3	96.6	96.9	95.6	96.3	96.9	84.5	91.3	100.2	89.5	95.3	100.3	60.4	82.2
16	ELECTRICAL	93.6	80.7	84.8	102.6	106.2	105.1	93.7	80.6	84.8	102.2	89.2	93.4	96.7	80.7	85.8	88.7	70.8	76.5
01 - 16	WEIGHTED AVERAGE	96.2	79.8	88.2	97.4	96.1	96.8	95.1	91.6	93.4	95.6	87.0	91.4	94.9	85.2	90.2	97.7	71.6	85.1

DIVISION		MISSOURI																	
		KANSAS CITY			KIRKSVILLE			POPLAR BLUFF			ROLLA			SEDALIA			SIKESTON		
		640 - 641			635			639			654 - 655			653			638		
		MAT.	INST.	TOTAL	MAT.	INST.	TOTAL	MAT.	INST.	TOTAL	MAT.	INST.	TOTAL	MAT.	INST.	TOTAL	MAT.	INST.	TOTAL
02	SITE CONSTRUCTION	91.1	94.6	93.8	89.3	89.9	89.7	75.0	93.7	89.4	98.1	94.7	95.5	87.8	91.0	90.2	78.5	93.8	90.2
03100	CONCRETE FORMS & ACCESSORIES	104.8	92.5	94.3	82.6	72.6	74.1	82.5	72.7	74.1	95.8	52.5	58.6	93.2	64.5	68.6	83.9	73.0	74.6
03200	CONCRETE REINFORCEMENT	96.6	96.2	96.4	98.8	76.7	86.2	101.8	77.0	87.7	98.2	70.0	82.2	96.6	76.2	85.1	101.1	77.0	87.4
03300	CAST-IN-PLACE CONCRETE	95.4	96.8	96.0	91.3	80.4	86.7	70.1	76.1	72.6	87.8	58.3	75.5	91.7	76.8	85.5	74.9	78.4	76.4
03	CONCRETE	92.9	95.5	94.2	96.8	77.4	87.0	75.4	76.0	75.7	82.4	60.3	71.3	93.2	72.5	82.8	79.0	77.0	78.0
04	MASONRY	101.3	97.4	98.8	122.4	66.0	87.3	113.6	73.1	88.4	107.7	58.9	77.3	113.9	60.5	80.7	114.0	74.0	89.0
05	METALS	100.4	106.9	102.7	93.0	96.0	94.1	95.5	97.1	96.1	93.3	100.7	95.9	91.4	94.7	92.6	96.4	97.1	96.0
06	WOOD & PLASTICS	104.0	90.6	97.1	79.5	72.7	76.0	78.3	72.7	75.4	99.5	49.9	73.9	92.9	60.9	76.3	79.6	72.7	76.0
07	THERMAL & MOISTURE PROTECTION	97.2	96.4	96.8	95.8	77.7	87.3	95.3	78.6	87.5	92.0	57.7	76.0	95.4	76.2	86.4	96.5	79.0	87.8
08	DOORS & WINDOWS	98.4	94.6	97.5	101.9	76.1	95.6	102.9	89.1	94.7	93.8	53.9	84.0	97.4	67.4	90.1	102.9	69.1	94.7
09200	PLASTER & GYPSUM BOARD	107.1	90.0	96.5	96.0	71.4	80.7	96.5	71.4	80.9	107.2	48.0	70.5	99.0	59.3	74.4	97.0	71.4	81.1
09500	CEILINGS	102.6	90.0	94.3	89.7	71.4	77.7	92.5	71.4	78.6	90.9	48.0	62.7	89.5	59.3	69.7	92.5	71.4	78.6
09600	FLOORING	96.2	96.4	96.2	79.8	68.2	77.0	94.2	62.3	86.5	112.2	58.1	99.0	87.0	86.1	86.8	94.9	62.3	86.9
09900	PAINTS & COATINGS	95.9	96.9	96.5	91.2	55.1	70.1	90.6	65.5	75.9	95.3	43.2	64.9	95.3	87.6	90.8	90.6	65.5	75.9
09	FINISHES	98.5	93.1	95.7	90.0	69.2	79.4	92.1	69.2	80.4	96.4	51.0	73.2	91.4	70.1	80.5	92.6	69.4	80.7
10 - 14	TOTAL DIV. 10000 - 14000	100.0	94.9	98.9	100.0	77.0	95.1	100.0	77.2	95.2	100.0	74.7	94.6	100.0	83.2	96.4	100.0	77.5	95.2
15	MECHANICAL	100.1	96.9	98.6	97.0	84.1	91.1	97.0	93.1	95.2	97.0	90.2	93.9	96.9	81.8	90.1	97.0	93.5	95.4
16	ELECTRICAL	102.8	103.4	103.2	94.3	80.6	85.0	94.5	106.2	102.5	91.0	36.4	53.8	92.4	92.4	92.4	93.1	106.2	102.0
01 - 16	WEIGHTED AVERAGE	98.9	97.9	98.4	97.2	80.0	88.8	94.4	86.7	90.7	94.6	67.8	81.6	95.6	80.1	88.1	94.9	87.0	91.1

DIVISION		MISSOURI									MONTANA								
		SPRINGFIELD			ST. JOSEPH			ST. LOUIS			BILLINGS			BUTTE			GREAT FALLS		
		656 - 658			644 - 645			630 - 631			590 - 591			597			594		
		MAT.	INST.	TOTAL	MAT.	INST.	TOTAL	MAT.	INST.	TOTAL	MAT.	INST.	TOTAL	MAT.	INST.	TOTAL	MAT.	INST.	TOTAL
02	SITE CONSTRUCTION	90.3	94.5	93.5	92.5	91.4	91.6	96.3	97.0	96.8	80.6	98.8	94.6	86.5	97.5	94.9	89.8	98.2	96.3
03100	CONCRETE FORMS & ACCESSORIES	103.7	59.3	65.5	104.7	75.5	79.6	102.9	107.5	106.9	94.8	87.9	88.8	80.7	90.5	89.1	101.3	88.2	90.1
03200	CONCRETE REINFORCEMENT	93.9	95.0	94.5	95.4	86.2	90.2	91.5	106.8	100.2	97.7	101.8	100.0	106.0	101.9	103.7	97.7	102.0	100.1
03300	CAST-IN-PLACE CONCRETE	97.0	66.4	84.3	95.3	91.4	93.7	87.5	110.7	97.2	114.9	83.9	102.0	118.3	79.1	102.0	125.0	72.8	103.2
03	CONCRETE	92.7	70.0	81.3	92.7	84.2	88.4	84.8	109.7	97.3	100.9	89.4	95.1	100.7	88.9	94.8	106.3	85.7	96.0
04	MASONRY	87.4	68.9	75.9	100.4	75.0	84.6	97.3	110.4	105.4	122.7	94.3	105.0	121.0	96.8	105.9	124.9	99.9	109.4
05	METALS	97.5	100.8	98.7	99.0	99.7	99.2	98.0	124.6	107.5	97.0	98.6	97.6	96.4	98.0	97.0	97.4	98.5	97.8
06	WOOD & PLASTICS	102.5	56.5	78.7	104.5	73.7	88.6	104.0	105.6	104.8	96.7	88.4	92.4	83.1	93.7	88.6	105.6	88.1	96.6
07	THERMAL & MOISTURE PROTECTION	96.0	68.6	83.2	97.9	80.4	89.7	91.7	104.8	97.9	97.2	88.1	92.9	96.4	87.0	92.0	97.4	87.3	92.7
08	DOORS & WINDOWS	99.5	68.2	91.9	99.2	83.0	95.2	94.8	111.2	98.8	103.3	86.9	99.3	99.9	89.7	97.4	103.6	86.8	99.5
09200	PLASTER & GYPSUM BOARD	109.2	54.7	75.4	112.8	72.5	87.9	105.2	105.4	105.3	97.2	88.5	91.8	89.7	94.0	92.4	97.2	88.2	91.6
09500	CEILINGS	96.4	54.7	69.0	101.3	72.5	82.4	96.6	105.4	102.4	111.4	88.5	96.4	108.7	94.0	99.1	111.4	88.2	96.2
09600	FLOORING	110.4	62.3	98.7	98.8	76.4	93.3	107.2	101.0	105.7	111.4	64.9	100.0	103.2	51.6	90.6	111.4	70.1	101.3
09900	PAINTS & COATINGS	90.2	73.1	80.2	91.6	82.3	86.1	95.6	110.0	104.0	104.7	81.0	90.9	104.7	62.5	80.1	104.7	70.4	84.7
09	FINISHES	99.3	60.3	79.4	99.7	75.6	87.4	97.0	106.1	101.7	105.8	82.7	94.0	101.4	80.5	90.7	105.9	82.8	94.1
10 - 14	TOTAL DIV. 10000 - 14000	100.0	84.7	96.8	100.0	89.2	97.7	100.0	107.0	101.5	100.0	88.0	97.5	100.0	88.0	97.5	100.0	88.8	97.6
15	MECHANICAL	100.3	68.5	86.9	100.3	77.4	89.9	100.1	109.6	104.4	100.3	89.8	95.5	100.3	81.3	91.7	100.3	91.0	96.1
16	ELECTRICAL	100.0	71.5	80.5	102.2	76.0	84.3	99.3	117.0	111.4	92.8	86.1	88.2	104.2	64.4	77.1	92.8	83.1	86.2
01 - 16	WEIGHTED AVERAGE	97.6	74.0	86.2	98.9	81.6	90.5	96.4	110.4	103.2	100.8	90.2	95.6	100.5	84.8	92.9	102.0	89.9	96.1

		02060 | Aggregate	CREW	DAILY OUTPUT	LABOR-HOURS	UNIT	2000 BARE COSTS MAT.	LABOR	EQUIP.	TOTAL	TOTAL INCL O&P	
150	0010	**BORROW** R02315-400										150
	0020	and spread, with 200 H.P. dozer, no compaction										
	0100	Bank run gravel **CN**	B-15	600	.047	C.Y.	5.20	1.14	2.84	9.18	10.55	
	0200	Common borrow		600	.047		4.77	1.14	2.84	8.75	10.10	
	0300	Crushed stone, (1.40 tons per CY), 1-1/2"		600	.047		17.05	1.14	2.84	21.03	23.50	
	0320	3/4" **CN**		600	.047		18.80	1.14	2.84	22.78	25.50	
	0340	1/2"		600	.047		18.25	1.14	2.84	22.23	25	
	0360	3/8"		600	.047		15.75	1.14	2.84	19.73	22	
	0400	Sand, washed, concrete		600	.047		10.65	1.14	2.84	14.63	16.55	
	0500	Dead or bank sand		600	.047		3.50	1.14	2.84	7.48	8.70	
	0600	Select structural fill		600	.047		7.50	1.14	2.84	11.48	13.10	
	0700	Screened loam **CN**		600	.047		17.95	1.14	2.84	21.93	25	
	0800	Topsoil, weed free		600	.047		13.10	1.14	2.84	17.08	19.25	
	0900	For 5 mile haul, add	B-34B	200	.040			.91	2.24	3.15	3.86	
		02065 | Cement & Concrete										
300	0010	**ASPHALTIC CONCRETE** plant mix (145 lb. per C.F.) **CN** R02065-300				Ton	30			30	33	300
	0200	All weather patching mix, hot					31.50			31.50	34.50	
	0250	Cold patch					36			36	39.50	
	0300	Berm mix					31.50			31.50	34.50	
		02080 | Utility Materials										
400	0010	**PIPING, WATER DISTRIBUTION** Mech. joints unless noted										400
	1000	Fire hydrants, two way; excavation and backfill not incl.										
	1100	4-1/2" valve size, depth 2'-0"	B-21	10	2.800	Ea.	730	72	13.85	815.85	930	
	1120	2'-6"		10	2.800		770	72	13.85	855.85	975	
	1140	3'-0"		10	2.800		815	72	13.85	900.85	1,025	
	1300	7'-0"		6	4.667		985	120	23	1,128	1,300	
	2400	Lower barrel extensions with stems, 1'-0"	B-20	14	1.714		242	43		285	335	
	2480	3'-0"	"	12	2		735	50		785	885	
790	0010	**UNDERGROUND MARKING TAPE**										790
	0400	Underground tape, detectable aluminum, 2"	1 Clab	150	.053	C.L.F.	3.70	1.19		4.89	5.95	
	0500	6"	"	140	.057	"	9.25	1.27		10.52	12.20	
800	0010	**UTILITY VAULTS** Precast concrete, 6" thick										800
	0050	5' x 10' x 6' high, I.D.	B-13	2	28	Ea.	1,400	670	280	2,350	2,875	
	0100	6' x 10' x 6' high, I.D.		2	28		1,425	670	280	2,375	2,925	
	0150	5' x 12' x 6' high, I.D.		2	28		1,525	670	280	2,475	3,025	
	0200	6' x 12' x 6' high, I.D.		1.80	31.111		1,700	745	310	2,755	3,375	
	0250	6' x 13' x 6' high, I.D.		1.50	37.333		2,250	895	375	3,520	4,250	
	0300	8' x 14' x 7' high, I.D.		1	56		2,425	1,350	560	4,335	5,375	
	0350	Hand hole, precast concrete, 1-1/2" thick										
	0400	1'-0" x 2'-0" x 1'-9", I.D., light duty	B-1	4	6	Ea.	355	138		493	605	
	0450	4'-6" x 3'-2" x 2'-0", O.D., heavy duty	B-6	3	8	"	880	192	67.50	1,139.50	1,350	



02305 | Equipment

			CREW	DAILY OUTPUT	LABOR-HOURS	UNIT	2000 BARE COSTS MAT.	LABOR	EQUIP.	TOTAL	TOTAL INCL O&P	
250	0010	**MOBILIZATION OR DEMOBILIZATION** Up to 50 miles R01590-100										250
	0020	Dozer, loader, backhoe or excavator, 70 H.P.- 250 H.P.	B-34K	6	1.333	Ea.		30.50	153	183.50	215	
	0100	Above 250 H.P		4	2			45.50	229	274.50	320	
	0300	Scraper, towed type (incl. tractor), 6 C.Y. capacity		3.75	2.133			48.50	244	292.50	345	
	0400	10 C.Y.		3.50	2.286			52	262	314	370	
	0600	Self-propelled scraper, 15 C.Y.		3.30	2.424			55.50	278	333.50	390	
	0700	24 C.Y.		3	2.667			61	305	366	430	
	0900	Shovel or dragline, 3/4 C.Y.		3.60	2.222			50.50	254	304.50	360	
	1000	1-1/2 C.Y.		3	2.667			61	305	366	430	
	1100	Delivery charge for small equipment on flatbed trailer, minimum									40	
	1150	Maximum									100	
	3000	For large pieces of equipment, allow for knockdown, assembly										
	3001	and load and tail vehicles for highway transport										

02310 | Grading

440	0010	**FINE GRADE** Area to be paved with grader, small area	B-11L	400	.040	S.Y.		1.02	1.29	2.31	3	440
	0100	Large area		2,000	.008			.20	.26	.46	.60	
	1100	Fine grade for slab on grade, machine		1,040	.015			.39	.50	.89	1.16	
	1150	Hand grading	B-18	700	.034			.79	.09	.88	1.34	
460	0010	**LOAM OR TOPSOIL** Remove and stockpile on site										460
	0020	6" deep, 200' haul	B-10B	865	.014	C.Y.		.37	.93	1.30	1.60	
	0100	300' haul		520	.023			.61	1.55	2.16	2.65	
	0150	500' haul		225	.053			1.42	3.59	5.01	6.10	
	0200	Alternate method: 6" deep, 200' haul		5,090	.002	S.Y.		.06	.16	.22	.27	
	0250	500' haul		1,325	.009	"		.24	.61	.85	1.04	
	0400	Spread from pile to rough finish grade, F.E. loader, 1.5 C.Y.	B-10S	200	.060	C.Y.		1.60	1.52	3.12	4.12	
	0500	Up to 200' radius, by hand	1 Clab	14	.571			12.70		12.70	20	
	0600	Top dress by hand, 1 C.Y. for 600 S.F.	"	11.50	.696		17.35	15.50		32.85	43.50	
	0700	Furnish and place, truck dumped, screened, 4" deep	B-10S	1,300	.009	S.Y.	2.17	.25	.23	2.65	3.03	
	0800	6" deep	"	820	.015	"	2.78	.39	.37	3.54	4.06	

02315 | Excavation and Fill

100	0010	**BACKFILL** By hand, no compaction, light soil R02315-300	1 Clab	14	.571	C.Y.		12.70		12.70	20	100
	0100	Heavy soil		11	.727			16.20		16.20	25.50	
	0300	Compaction in 6" layers, hand tamp, add to above		20.60	.388			8.65		8.65	13.60	
	0400	Roller compaction operator walking, add	B-10A	100	.120			3.20	.94	4.14	5.95	
	0500	Air tamp, add	B-9C	190	.211			4.77	.95	5.72	8.55	
	0600	Vibrating plate, add	A-1	60	.133			2.97	1.17	4.14	5.95	
	0800	Compaction in 12" layers, hand tamp, add to above	1 Clab	34	.235			5.25		5.25	8.25	
	0900	Roller compaction operator walking, add	B-10A	150	.080			2.13	.63	2.76	3.96	
	1000	Air tamp, add	B-9	285	.140			3.18	.63	3.81	5.70	
	1100	Vibrating plate, add	A-1	90	.089			1.98	.78	2.76	3.97	
	1300	Dozer backfilling, bulk, up to 300' haul, no compaction	B-10B	1,200	.010			.27	.67	.94	1.15	
	1400	Air tamped	B-11B	240	.067			1.70	4.21	5.91	7.25	
	1600	Compacting backfill, 6" to 12" lifts, vibrating roller	B-10C	800	.015			.40	1.15	1.55	1.87	
	1700	Sheepsfoot roller	B-10D	750	.016			.43	1.24	1.67	2.02	
	1900	Dozer backfilling, trench, up to 300' haul, no compaction	B-10B	900	.013			.36	.90	1.26	1.53	
	2000	Air tamped	B-11B	235	.068			1.74	4.30	6.04	7.40	
	2200	Compacting backfill, 6" to 12" lifts, vibrating roller	B-10C	700	.017			.46	1.31	1.77	2.14	
	2300	Sheepsfoot roller	B-10D	650	.018			.49	1.44	1.93	2.33	
	2350	Spreading in 8" layers, small dozer	B-10S	1,060	.011			.30	.76	1.06	1.30	
120	0010	**BACKFILL, STRUCTURAL** Dozer or F.E. loader										120
	0020	From existing stockpile, no compaction										

02315 | Excavation and Fill

			CREW	DAILY OUTPUT	LABOR-HOURS	UNIT	2000 BARE COSTS MAT.	LABOR	EQUIP.	TOTAL	TOTAL INCL. O&P	
120	2000	75 H.P., 50' haul, sand & gravel	B-10L	1,100	.011	C.Y.		.29	.25	.54	.73	120
	2020	Common earth		975	.012			.33	.29	.62	.82	
	2040	Clay		850	.014			.38	.33	.71	.94	
	2400	300' haul, sand & gravel		370	.032			.86	.76	1.62	2.16	
	2420	Common earth		330	.036			.97	.85	1.82	2.42	
	2440	Clay		290	.041			1.10	.96	2.06	2.75	
	3000	105 H.P., 50' haul, sand & gravel	B-10W	1,350	.009			.24	.29	.53	.68	
	3020	Common earth		1,225	.010			.26	.32	.58	.75	
	3040	Clay		1,100	.011			.29	.36	.65	.84	
	3300	300' haul, sand & gravel		465	.026			.69	.85	1.54	1.98	
	3320	Common earth		415	.029			.77	.95	1.72	2.22	
	3340	Clay		370	.032			.86	1.06	1.92	2.50	
	4000	200 H.P., 50' haul, sand & gravel	B-10B	2,500	.005			.13	.32	.45	.56	
	4020	Common earth		2,200	.005			.15	.37	.52	.62	
	4040	Clay		1,950	.006			.16	.41	.57	.71	
	4400	300' haul, sand & gravel		805	.015			.40	1	1.40	1.71	
	4420	Common earth		735	.016			.44	1.10	1.54	1.88	
	4440	Clay		660	.018			.48	1.22	1.70	2.08	
	5000	300 H.P., 50' haul, sand & gravel	B-10M	3,170	.004			.10	.35	.45	.53	
	5020	Common earth		2,900	.004			.11	.38	.49	.59	
	5040	Clay		2,700	.004			.12	.41	.53	.63	
	5400	300' haul, sand & gravel		1,500	.008			.21	.74	.95	1.14	
	5420	Common earth		1,350	.009			.24	.82	1.06	1.26	
	5440	Clay		1,225	.010			.26	.90	1.16	1.39	
	6010	For trench backfill, see div. 02315-900 & 02315-940										
	6100	For compaction, see div. 02315-320										
130	0010	**BEDDING** For pipe and conduit, not incl. compaction										130
	0050	Crushed or screened bank run gravel	B-6	150	.160	C.Y.	6.50	3.85	1.35	11.70	14.55	
	0100	Crushed stone 3/4" to 1/2"		150	.160		17.05	3.85	1.35	22.25	26	
	0200	Sand, dead or bank		150	.160		3.50	3.85	1.35	8.70	11.30	
	0500	Compacting bedding in trench	A-1	90	.089			1.98	.78	2.76	3.97	
320	0010	**COMPACTION, STRUCTURAL** Steel wheel tandem roller, 5 tons R02315-300	B-10E	8	1.500	Hr.		40	16.65	56.65	80	320
	0100	10 tons	B-10F	8	1.500	"		40	28	68	92.50	
	0300	Sheepsfoot or wobbly wheel roller, 8" lifts, common fill	B-10G	1,300	.009	C.Y.		.25	.44	.69	.86	
	0400	Select fill	"	1,500	.008			.21	.38	.59	.75	
	0600	Vibratory plate, 8" lifts, common fill	A-1	200	.040			.89	.35	1.24	1.79	
	0700	Select fill	"	216	.037			.82	.32	1.14	1.66	
340	0010	**DRILLING AND BLASTING** Only, rock, open face, under 1500 C.Y.	B-47	225	.107	C.Y.	1.60	2.64	2.77	7.01	8.90	340
	0100	Over 1500 C.Y.		300	.080		1.60	1.98	2.08	5.66	7.10	
	0200	Areas where blasting mats are required, under 1500 C.Y.		175	.137		1.60	3.39	3.57	8.56	10.95	
	0250	Over 1500 C.Y.		250	.096		1.60	2.37	2.50	6.47	8.20	
	0300	Bulk drilling and blasting, can vary greatly, average									5	
	0500	Pits, average									20	
	1300	Deep hole method, up to 1500 C.Y.	B-47	50	.480		1.60	11.85	12.50	25.95	34	
	1400	Over 1500 C.Y.		66	.364		1.60	9	9.45	20.05	26	
	1900	Restricted areas, up to 1500 C.Y.		13	1.846		1.60	45.50	48	95.10	126	
	2000	Over 1500 C.Y.		20	1.200		1.60	29.50	31	62.10	82.50	
	2200	Trenches, up to 1500 C.Y.		22	1.091		4.64	27	28.50	60.14	78	
	2300	Over 1500 C.Y.		26	.923		4.64	23	24	51.64	67	
	2500	Pier holes, up to 1500 C.Y.		22	1.091		1.60	27	28.50	57.10	75	
	2600	Over 1500 C.Y.		31	.774		1.60	19.15	20	40.75	53.50	
	2800	Boulders under 1/2 C.Y., loaded on truck, no hauling	B-10O	80	.150			4	5.65	9.65	12.35	
	2900	Boulders, drilled, blasted	B-47	100	.240		1.60	5.95	6.25	13.80	17.80	
	3100	Jackhammer operators with foreman compressor, air tools	B-9	1	40	Day		905	180	1,085	1,625	
	3300	Track drill, compressor, operator and foreman	B-47	1	24	"		595	625	1,220	1,600	

02315 | Excavation and Fill

			CREW	DAILY OUTPUT	LABOR-HOURS	UNIT	2000 BARE COSTS MAT.	LABOR	EQUIP.	TOTAL	TOTAL INCL O&P	
440	2060	2 C.Y. bucket	B-12C	200	.080	C.Y.		2.18	5.10	7.28	8.90	440
	2070	Sand and gravel, 3/4 C.Y. bucket	B-12F	100	.160			4.36	4.56	8.92	11.65	
	2080	1 C.Y. bucket	B-12A	120	.133			3.64	4.48	8.12	10.45	
	2090	1-1/2 C.Y. bucket	B-12B	160	.100			2.73	4.46	7.19	9.05	
	3000	2 C.Y. bucket	B-12C	220	.073			1.98	4.62	6.60	8.10	
	3010	Clay, till, or blasted rock, 3/4 C.Y. bucket	B-12F	80	.200			5.45	5.70	11.15	14.55	
	3020	1 C.Y. bucket	B-12A	95	.168			4.59	5.65	10.24	13.25	
	3030	1-1/2 C.Y. bucket	B-12B	130	.123			3.36	5.50	8.86	11.15	
	3040	2 C.Y. bucket	B-12C	175	.091	▼		2.49	5.80	8.29	10.20	
	9010	For mobilization or demobilization, see div. 02305-250										
	9020	For dewatering, see div. 02240-500										
	9022	For larger structures, see Bulk Excavation, div. 02315-400										
	9024	For loading onto trucks, add								15%		
	9026	For hauling, see div. 02320-200										
	9030	For sheeting or soldier beams/lagging, see div. 02250 & 02260										
	9040	For trench excavation of strip footings, see div. 02315-900										
500	0010	**FILL** Borrow, load, 1 mile haul, spread with dozer										500
	0020	for embankments	B-15	1,200	.023	C.Y.	4.77	.57	1.42	6.76	7.70	
	0100	Select fill for shoulders & embankments	"	1,200	.023	"	7.50	.57	1.42	9.49	10.70	
	0201	For hauling over 1 mile, add to above per C.Y., div. 02320-200				Mile				.62	.82	
505	0010	**FILL** Spread dumped material, by dozer, no compaction	B-10B	1,000	.012	C.Y.		.32	.81	1.13	1.38	505
	0100	By hand	1 Clab	12	.667	"		14.85		14.85	23.50	
	0500	Gravel fill, compacted, under floor slabs, 4" deep	B-37	10,000	.005	S.F.	.15	.11	.01	.27	.36	
	0600	6" deep		8,600	.006		.23	.13	.02	.38	.47	
	0700	9" deep		7,200	.007		.38	.16	.02	.56	.67	
	0800	12" deep		6,000	.008	▼	.52	.19	.02	.73	.89	
	1000	Alternate pricing method, 4" deep		120	.400	C.Y.	11.25	9.40	1.11	21.76	28.50	
	1100	6" deep		160	.300		11.25	7.05	.83	19.13	24.50	
	1200	9" deep		200	.240		11.25	5.65	.67	17.57	22	
	1300	12" deep	▼	220	.218	▼	11.25	5.10	.61	16.96	21	
	1500	For fill under exterior paving, see division 02720-200										
900	0010	**EXCAVATING, TRENCH** or continuous footing, common earth										900
	0020	No sheeting or dewatering included										
	0050	1' to 4' deep, 3/8 C.Y. tractor loader/backhoe	B-11C	150	.107	C.Y.		2.73	1.35	4.08	5.70	
	0060	1/2 C.Y. tractor loader/backhoe	B-11M	200	.080			2.04	1.37	3.41	4.65	
	0090	4' to 6' deep, 1/2 C.Y. tractor loader/backhoe	"	200	.080			2.04	1.37	3.41	4.65	
	0100	5/8 C.Y. hydraulic backhoe	B-12Q	250	.064			1.75	1.65	3.40	4.46	
	0110	3/4 C.Y. hydraulic backhoe	B-12F	300	.053			1.45	1.52	2.97	3.88	
	0300	1/2 C.Y. hydraulic excavator, truck mounted	B-12J	200	.080			2.18	3.09	5.27	6.70	
	0500	6' to 10' deep, 3/4 C.Y. hydraulic backhoe, 6' to 10' deep	B-12F	225	.071			1.94	2.03	3.97	5.20	
	0510	1 C.Y. hydraulic backhoe	B-12A	400	.040			1.09	1.35	2.44	3.14	
	0600	1 C.Y. hydraulic excavator, truck mounted	B-12K	400	.040			1.09	2.04	3.13	3.91	
	0610	1-1/2 C.Y. hydraulic backhoe	B-12B	600	.027			.73	1.19	1.92	2.41	
	0900	10' to 14' deep, 3/4 C.Y. hydraulic backhoe	B-12F	200	.080			2.18	2.28	4.46	5.80	
	0910	1 C.Y. hydraulic backhoe	B-12A	360	.044			1.21	1.49	2.70	3.48	
	1000	1-1/2 C.Y. hydraulic backhoe	B-12B	540	.030			.81	1.32	2.13	2.68	
	1300	14' to 20' deep, 1 C.Y. hydraulic backhoe	B-12A	320	.050			1.36	1.68	3.04	3.92	
	1310	1-1/2 C.Y. hydraulic backhoe	B-12B	480	.033			.91	1.49	2.40	3.01	
	1320	2-1/2 C.Y. hydraulic backhoe	B-12S	850	.019			.51	1.97	2.48	2.95	
	1400	By hand with pick and shovel 2' to 6' deep, light soil	1 Clab	8	1			22.50		22.50	35	
	1500	Heavy soil	"	4	2			44.50		44.50	70	
	1700	For tamping backfilled trenches, air tamp, add	A-1	100	.080			1.78	.70	2.48	3.57	
	1900	Vibrating plate, add	B-18	230	.104	▼		2.39	.26	2.65	4.05	
	2100	Trim sides and bottom for concrete pours, common earth		1,500	.016	S.F.		.37	.04	.41	.62	
	2300	Hardpan	▼	600	.040	"		.92	.10	1.02	1.55	

02510 | Water Distribution

			CREW	DAILY OUTPUT	LABOR-HOURS	UNIT	2000 BARE COSTS MAT.	LABOR	EQUIP.	TOTAL	TOTAL INCL O&P
800	0010	**PIPING, WATER DISTRIBUTION SYSTEMS** Pipe laid in trench,									
	0020	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.	7.15	4.18		11.33	14.50
	1420	6" diameter		126	.190		8.20	4.78		12.98	16.55
	1430	8" diameter		108	.222		10.75	5.55		16.30	20.50
	1440	10" diameter		90	.267		14.55	6.70		21.25	26.50
	1450	12" diameter **CN**	B-21	72	.389		18	10	1.92	29.92	37.50
	1460	14" diameter		54	.519		23	13.35	2.56	38.91	49
	1470	16" diameter		46	.609		25	15.70	3.01	43.71	55.50
	1480	18" diameter		42	.667		31.50	17.20	3.29	51.99	65.50
	1490	24" diameter		35	.800		47.50	20.50	3.95	71.95	89
	1550	Push on joint, 4" diameter	B-20	155	.155		6.35	3.88		10.23	13.05
	1560	6" diameter		135	.178		7.25	4.46		11.71	15
	1570	8" diameter		115	.209		9.95	5.25		15.20	19.20
	1580	10" diameter		98	.245		15.60	6.15		21.75	27
	1590	12" diameter		78	.308		16.45	7.70		24.15	30
	1600	14" diameter	B-21	58	.483		18.05	12.45	2.38	32.88	42
	1610	16" diameter		52	.538		25.50	13.90	2.66	42.06	52.50
	1620	18" diameter		43	.651		28.50	16.80	3.22	48.52	61
	1630	20" diameter		41	.683		31	17.60	3.37	51.97	65
	1640	24" diameter		40	.700		40	18.05	3.46	61.51	76
	1950	Butterfly valves with boxes, cast iron									
	1970	4" diameter	B-20	6	4	Ea.	465	100		565	670
	1990	6" diameter		5	4.800		490	120		610	730
	2010	8" diameter	B-21	4	7		675	180	34.50	889.50	1,075
	2030	10" diameter		3.50	8		980	206	39.50	1,225.50	1,450
	2050	12" diameter		3	9.333		1,275	241	46	1,562	1,825
	2070	14" diameter		2	14		2,325	360	69	2,754	3,200
	2090	16" diameter		2	14		2,850	360	69	3,279	3,800
	2650	Polyvinyl chloride pipe, class 160, S.D.R.-26, 1-1/2" diameter	B-20	300	.080	L.F.	.27	2.01		2.28	3.46
	2700	2" diameter		250	.096		.38	2.41		2.79	4.21
	2750	2-1/2" diameter		250	.096		.50	2.41		2.91	4.34
	2800	3" diameter		200	.120		.75	3.01		3.76	5.55
	2850	4" diameter		200	.120		1.18	3.01		4.19	6.05
	2900	6" diameter		180	.133		2.50	3.34		5.84	8
	2950	8" diameter	B-21	160	.175		4.25	4.51	.86	9.62	12.70
	8000	Fittings, ductile iron, mechanical joint									
	8010	90° bend 4" diameter Use same for 22° & 45° bends	B-20	37	.649	Ea.	104	16.25		120.25	140
	8020	6" diameter		25	.960		169	24		193	223
	8040	8" diameter		21	1.143		245	28.50		273.50	315
	8060	10" diameter	B-21	21	1.333		182	34.50	6.60	223.10	261
	8080	12" diameter		18	1.556		430	40	7.70	477.70	545
	8100	14" diameter		16	1.750		550	45	8.65	603.65	685
	8120	16" diameter		14	2		635	51.50	9.90	696.40	790
	8140	18" diameter		10	2.800		2,025	72	13.85	2,110.85	2,350
	8160	20" diameter		8	3.500		2,200	90	17.30	2,307.30	2,575
	8180	24" diameter		6	4.667		2,400	120	23	2,543	2,850
	8200	Wye or tee, 4" diameter	B-20	25	.960		169	24		193	224
	8220	6" diameter		17	1.412		178	35.50		213.50	252
	8240	8" diameter		14	1.714		255	43		298	350
	8260	10" diameter	B-21	14	2		550	51.50	9.90	611.40	695
	8280	12" diameter		12	2.333		745	60	11.55	816.55	925
	8300	14" diameter		10	2.800		875	72	13.85	960.85	1,100
	8320	16" diameter		8	3.500		1,000	90	17.30	1,107.30	1,250
	8340	18" diameter		6	4.667		2,075	120	23	2,218	2,500

		02510 | Water Distribution	CREW	DAILY OUTPUT	LABOR-HOURS	UNIT	2000 BARE COSTS MAT.	LABOR	EQUIP.	TOTAL	TOTAL INCL O&P	
800	8360	20" diameter	B-21	4	7	Ea.	2,500	180	34.50	2,714.50	3,075	800
	8380	24" diameter	↓	3	9.333	↓	2,950	241	46	3,237	3,675	
		02520 | Wells										
900	0010	**WELLS** Domestic water										900
	0100	Drilled, 4" to 6" diameter	B-23	120	.333	L.F.		7.55	16.45	24	30	
	0200	8" diameter	"	95.20	.420	"		9.50	21	30.50	38	
	0400	Gravel pack well, 40' deep, incl. gravel & casing, complete										
	0500	24" diameter casing x 18" diameter screen	B-23	.13	307	Total	20,000	6,975	15,200	42,175	49,700	
	0600	36" diameter casing x 18" diameter screen	↓	.12	333	"	21,500	7,550	16,500	45,550	53,500	
	0800	Observation wells, 1-1/4" riser pipe	↓	163	.245	V.L.F.	11	5.55	12.15	28.70	34	
	0900	For flush Buffalo roadway box, add	1 Skwk	16.60	.482	Ea.	30	13.85		43.85	55	
	1200	Test well, 2-1/2" diameter, up to 50' deep (15 to 50 GPM)	B-23	1.51	26.490	"	450	600	1,300	2,350	2,900	
	1300	Over 50' deep, add	"	121.80	.328	L.F.	12	7.45	16.25	35.70	43	
	1500	Pumps, installed in wells to 100' deep, 4" submersible										
	1510	1/2 H.P.	Q-1	3.22	4.969	Ea.	425	149		574	695	
	1520	3/4 H.P.	↓	2.66	6.015	↓	475	180		655	795	
	1600	1 H.P.	↓	2.29	6.987	↓	525	209		734	895	
	1700	1-1/2 H.P.	Q-22	1.60	10	↓	580	299	283	1,162	1,400	
	1800	2 H.P.	↓	1.33	12.030	↓	620	360	340	1,320	1,600	
	1900	3 H.P.	↓	1.14	14.035	↓	775	420	400	1,595	1,925	
	2000	5 H.P.	↓	1.14	14.035	↓	1,250	420	400	2,070	2,450	
	3000	Pump, 6" submersible, 25' to 150' deep, 25 H.P., 249 to 297 GPM	↓	.89	17.978	↓	3,775	540	510	4,825	5,525	
	3100	25' to 500' deep, 30 H.P., 100 to 300 GPM	↓	.73	21.918	↓	3,875	655	620	5,150	5,925	
	8000	Steel well casing	B-23A	3,020	.008	Lb.	.40	.20	.64	1.24	1.45	
	9950	See div. 02240-900 for wellpoints										
	9960	See div. 02240-700 for drainage wells										
0	0010	**PUMPS, WELL** Water system, with pressure control										910
	1000	Deep well, jet, 42 gal. galvanized tank										
	1040	3/4 HP	1 Plum	.80	10	Ea.	545	335		880	1,100	
	3000	Shallow well, jet, 30 gal. galvanized tank										
	3040	1/2 HP	1 Plum	2	4	Ea.	550	133		683	805	
		02530 | Sanitary Sewerage										
100	0010	**SEWAGE TREATMENT** Plant, not incl. fencing or external piping										100
	0020	Steel packaged, blown air aeration plants										
	0100	1,000 GPD				Gal.				15	17.25	
	0200	5,000 GPD				↓				10	11.50	
	0300	15,000 GPD				↓				5.50	6.30	
	0400	30,000 GPD				↓				5.20	6	
	0500	50,000 GPD FOR 40,000 USE SAME				↓				4	4.60	
	0600	100,000 GPD				↓				3.50	4	
	0700	200,000 GPD				↓				2.50	2.88	
	0800	500,000 GPD				↓				2.45	2.80	
	1000	Concrete, extended aeration, primary and secondary treatment										
	1010	10,000 GPD				Gal.				11	12.65	
	1100	30,000 GPD				↓				5.50	6.35	
	1200	50,000 GPD				↓				4.50	5.18	
	1400	100,000 GPD				↓				3.50	4.05	
	1500	500,000 GPD				↓				2.50	2.90	
	1700	Municipal wastewater treatment facility										
	1720	1.0 MGD				Gal.				4.30	4.95	
	1740	1.5 MGD				↓				4.25	4.90	
	1760	2.0 MGD				↓				3.65	4.20	

02530 | Sanitary Sewerage

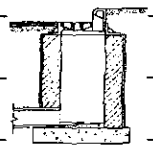
			CREW	DAILY OUTPUT	LABOR-HOURS	UNIT	2000 BARE COSTS MAT.	LABOR	EQUIP.	TOTAL	TOTAL INCL O&P	
730	3560	48" x 76" inside, round equivalent 60" diameter R02510 -810	B-13	26	2.154	L.F.	139	51.50	21.50	212	257	730
	3570	58" x 91" inside, round equivalent 72" diameter	↓	22	2.545	↓	206	61	25.50	292.50	350	
	3780	Concrete slotted pipe, class 4 mortar joint										
	3800	12" diameter	B-21	168	.167	L.F.	10.80	4.30	.82	15.92	19.50	
	3840	18" diameter	"	152	.184	"	16.75	4.75	.91	22.41	27	
	3900	Class 4 O-ring										
	3940	12" diameter	B-21	168	.167	L.F.	12.35	4.30	.82	17.47	21	
	3960	18" diameter	"	152	.184	"	18.55	4.75	.91	24.21	29	
780	0010	**PIPING, DRAINAGE & SEWAGE, POLYVINYL CHLORIDE**										780
	0020	Not including excavation or backfill										
	2000	10' lengths, S.D.R. 35, B&S, 4" diameter	B-20	375	.064	L.F.	2.21	1.61		3.82	4.96	
	2040	6" diameter		350	.069		2.87	1.72		4.59	5.85	
	2080	8" diameter	↓	335	.072		4.40	1.80		6.20	7.65	
	2120	10" diameter	B-21	330	.085		4.84	2.19	.42	7.45	9.20	
	2160	12" diameter		320	.087		5.10	2.25	.43	7.78	9.65	
	2200	15" diameter	↓	190	.147	↓	11.15	3.80	.73	15.68	19.05	
790	0010	**PIPING, DRAINAGE & SEWAGE, VITRIFIED CLAY** C700										790
	0020	Not including excavation or backfill,										
	4030	Extra strength, compression joints, C425										
	5000	4" diameter x 4' long	B-20	265	.091	L.F.	1.79	2.27		4.06	5.55	
	5020	6" diameter x 5' long	"	200	.120		2.93	3.01		5.94	7.95	
	5040	8" diameter x 5' long	B-21	200	.140		4.14	3.61	.69	8.44	10.95	
	5060	10" diameter x 5' long		190	.147		6.80	3.80	.73	11.33	14.20	
	5080	12" diameter x 6' long		150	.187		8.95	4.81	.92	14.68	18.35	
	5100	15" diameter x 7' long		110	.255		16.25	6.55	1.26	24.06	29.50	
	5120	18" diameter x 7' long		88	.318		23.50	8.20	1.57	33.27	40.50	
	5140	24" diameter x 7' long	↓	45	.622		48.50	16.05	3.07	67.62	82	
	5160	30" diameter x 7' long	B-22	31	.968		85	25	6.70	116.70	140	
	5180	36" diameter x 7' long	"	20	1.500		125	39	10.35	174.35	210	
	6000	For 3' lengths, add					30%	30%				
	6020	For 2' lengths, add					40%	60%				
	6060	For plain joints, deduct					25%					
	7060	2' lengths, add to above				↓	40%					

02540 | Septic Tank Systems

700	0010	**SEPTIC TANKS** Not incl. excav. or piping, precast, 1,000 gallon	B-21	8	3.500	Ea.	490	90	17.30	597.30	695	700
	0100	2,000 gallon	"	5	5.600		1,000	144	27.50	1,171.50	1,350	
	0200	5,000 gallon	B-13	3.50	16		4,775	385	160	5,320	6,025	
	0300	15,000 gallon, 4 piece	B-13B	1.70	32.941		11,000	790	475	12,265	13,900	
	0400	25,000 gallon, 4 piece		1.10	50.909		24,400	1,225	735	26,360	29,600	
	0500	40,000 gallon, 4 piece	↓	.80	70		31,800	1,675	1,000	34,475	38,700	
	0520	50,000 gallon, 5 piece	B-13C	.60	93.333		36,600	2,225	1,900	40,725	45,800	
	0540	75,000 gallon, cast in place	C-14C	.25	448		44,500	12,100	152	56,752	68,500	
	0560	100,000 gallon	"	.15	746		55,000	20,200	254	75,454	93,000	
	0600	High density polyethylene, 1,000 gallon	B-21	6	4.667		800	120	23	943	1,100	
	0700	1,500 gallon	"	4	7		1,000	180	34.50	1,214.50	1,425	
	1000	Distribution boxes, concrete, 7 outlets	2 Clab	16	1		86.50	22.50		109	130	
	1100	9 outlets	"	8	2		225	44.50		269.50	320	
	1150	Leaching field chambers, 13' x 3'-7" x 1'-4", standard	B-13	16	3.500		665	84	35	784	900	
	1200	Heavy duty, 8' x 4' x 1'-6"		14	4		320	96	40	456	545	
	1300	13' x 3'-9" x 1'-6"		12	4.667		910	112	46.50	1,068.50	1,225	
	1350	20' x 4' x 1'-6"	↓	5	11.200		750	268	112	1,130	1,375	
	1400	Leaching pit, precast concrete, 3' diameter, 3' deep	B-21	8	3.500		145	90	17.30	252.30	320	
	1500	6' diameter, 3' section		4.70	5.957		375	154	29.50	558.50	690	
	2000	Velocity reducing pit, precast conc., 6' diameter, 3' deep	↓	4.70	5.957	↓	225	154	29.50	408.50	520	

02630 | Storm Drainage

			CREW	DAILY OUTPUT	LABOR-HOURS	UNIT	2000 BARE COSTS MAT.	LABOR	EQUIP.	TOTAL	TOTAL INCL O&P
200	0600	8' deep	D-1	.70	22.857	Ea.	510	580		1,090	1,475
	0700	For depths over 8', add	↓	5.50	2.909	V.L.F.	76.50	74		150.50	199
	0800	Concrete, cast in place, 4' x 4', 8" thick, 4' deep	C-14H	2	24	Ea.	340	670	18.95	1,028.95	1,450
	0900	6' deep		1.50	32		495	890	25.50	1,410.50	2,000
	1000	8' deep		1	48	↓	650	1,350	38	2,038	2,875
	1100	For depths over 8', add	↓	8	6	V.L.F.	84.50	167	4.74	256.24	365
	1110	Precast, 4' I.D., 4' deep	B-22	4.10	7.317	Ea.	315	191	50.50	556.50	700
	1120	6' deep		3	10		425	261	69	755	945
	1130	8' deep		2	15	↓	470	390	104	964	1,250
	1140	For depths over 8', add	↓	16	1.875	V.L.F.	78.50	49	12.95	140.45	177
	1150	5' I.D., 4' deep	B-6	3	8	Ea.	445	192	67.50	704.50	865
	1160	6' deep		2	12		605	289	102	996	1,225
	1170	8' deep		1.50	16	↓	760	385	135	1,280	1,575
	1180	For depths over 8', add		12	2	V.L.F.	99	48	16.90	163.90	202
	1190	6' I.D., 4' deep		2	12	Ea.	730	289	102	1,121	1,375
	1200	6' deep		1.50	16		950	385	135	1,470	1,800
	1210	8' deep		1	24	↓	1,175	575	203	1,953	2,400
	1220	For depths over 8', add	↓	8	3	V.L.F.	153	72	25.50	250.50	310
	1250	Slab tops, precast, 8" thick									
	1300	4' diameter manhole	B-6	8	3	Ea.	158	72	25.50	255.50	315
	1400	5' diameter manhole		7.50	3.200		275	77	27	379	455
	1500	6' diameter manhole		7	3.429		315	82.50	29	426.50	505
	1600	Frames & covers, C.I., 24" square, 500 lb.		7.80	3.077		213	74	26	313	380
	1700	26" D shape, 600 lb.		7	3.429		214	82.50	29	325.50	395
	1800	Light traffic, 18" diameter, 100 lb.		10	2.400		76.50	57.50	20.50	154.50	196
	1900	24" diameter, 300 lb.		8.70	2.759		138	66.50	23.50	228	280
	2000	36" diameter, 900 lb.		5.80	4.138		385	99.50	35	519.50	615
	2100	Heavy traffic, 24" diameter, 400 lb.		7.80	3.077		172	74	26	272	335
	2200	36" diameter, 1150 lb.		3	8		510	192	67.50	769.50	935
	2300	Mass. State standard, 26" diameter, 475 lb.		7	3.429		214	82.50	29	325.50	395
	2400	30" diameter, 620 lb.		7	3.429		243	82.50	29	354.50	425
	2500	Watertight, 24" diameter, 350 lb.		7.80	3.077		293	74	26	393	465
	2600	26" diameter, 500 lb.		7	3.429		330	82.50	29	441.50	525
	2700	32" diameter, 575 lb.	↓	6	4	↓	390	96	34	520	610
	2800	3 piece cover & frame, 10" deep,									
	2900	1200 lbs., for heavy equipment	B-6	3	8	Ea.	770	192	67.50	1,029.50	1,225
	3000	Raised for paving 1-1/4" to 2" high,									
	3100	4 piece expansion ring									
	3200	20" to 26" diameter	1 Clab	3	2.667	Ea.	102	59.50		161.50	206
	3300	30" to 36" diameter	"	3	2.667	"	143	59.50		202.50	251
	3320	Frames and covers, existing, raised for paving 2", including									
	3340	row of brick, concrete collar, up to 12" wide frame	B-6	18	1.333	Ea.	31	32	11.30	74.30	96.50
	3360	20" to 26" wide frame		11	2.182		41	52.50	18.45	111.95	147
	3380	30" to 36" wide frame	↓	9	2.667		51	64	22.50	137.50	181
	3400	Inverts, single channel brick	D-1	3	5.333		57	136		193	274
	3500	Concrete		5	3.200		45	81.50		126.50	177
	3600	Triple channel, brick		2	8		86.50	204		290.50	410
	3700	Concrete	↓	3	5.333		61	136		197	278
	3800	Steps, heavyweight cast iron, 7" x 9"	1 Bric	40	.200		8.35	5.70		14.05	18
	3900	8" x 9"		40	.200		12.50	5.70		18.20	22.50
	3928	12" x 10-1/2"		40	.200		13	5.70		18.70	23
	4000	Standard sizes, galvanized steel		40	.200		11.75	5.70		17.45	22
	4100	Aluminum	↓	40	.200	↓	13	5.70		18.70	23



02820 | Fences & Gates

			CREW	DAILY OUTPUT	LABOR-HOURS	UNIT	2000 BARE COSTS MAT.	LABOR	EQUIP.	TOTAL	TOTAL INCL O&P
500	6500	4' wide	B-1	10	2.400	Ea.	212	55		267	320
528	0010	**FENCE, CHAIN LINK INDUSTRIAL**, schedule 40									
	0020	3 strands barb wire, 2" post @ 10' O.C., set in concrete, 6' H									
	0200	9 ga. wire, galv. steel	B-80	240	.133	L.F.	7.20	3.22	2.29	12.71	15.45
	0300	Aluminized steel		240	.133		9.25	3.22	2.29	14.76	17.70
	0500	6 ga. wire, galv. steel		240	.133		11.70	3.22	2.29	17.21	20.50
	0600	Aluminized steel		240	.133		13.40	3.22	2.29	18.91	22.50
	0800	6 ga. wire, 6' high but omit barbed wire, galv. steel		250	.128		11.35	3.09	2.20	16.64	19.65
	0900	Aluminized steel		250	.128		15.85	3.09	2.20	21.14	24.50
	0920	8' H, 6 ga. wire, 2-1/2" line post, galv. steel		180	.178		18.45	4.29	3.06	25.80	30.50
	0940	Aluminized steel		180	.178		23	4.29	3.06	30.35	35
	1100	Add for corner posts, 3" diam., galv. steel		40	.800	Ea.	55	19.30	13.75	88.05	106
	1200	Aluminized steel		40	.800		66	19.30	13.75	99.05	118
	1300	Add for braces, galv. steel		80	.400		15	9.65	6.90	31.55	39
	1350	Aluminized steel		80	.400		20	9.65	6.90	36.55	44.50
	1400	Gate for 6' high fence, 1-5/8" frame, 3' wide, galv. steel		10	3.200		91	77	55	223	280
	1500	Aluminized steel		10	3.200		111	77	55	243	300
	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	2.57	1.83	10.40	12.60
	2200	Aluminized steel		300	.107	"	7.25	2.57	1.83	11.65	14
	2400	Gate, 4' wide, 5' high, 2" frame, galv. steel		10	3.200	Ea.	100	77	55	232	290
	2500	Aluminized steel		10	3.200	"	110	77	55	242	300
	3100	Overhead slide gate, chain link, 6' high, to 18' wide		38	.842	L.F.	82.50	20.50	14.50	117.50	138
	3110	Cantilever type		48	.667		38	16.10	11.45	65.55	79.50
	3120	8' high		24	1.333		55	32	23	110	136
	3130	10' high		18	1.778		65	43	30.50	138.50	172
	5000	Double swing gates, incl. posts & hardware									
	5010	5' high, 12' opening	B-80	3.40	9.412	Opng.	263	227	162	652	815
	5020	20' opening		2.80	11.429		340	276	197	813	1,025
	5060	6' high, 12' opening		3.20	10		475	241	172	888	1,100
	5070	20' opening		2.60	12.308		655	297	212	1,164	1,425
	5080	8' high, 12' opening		2.13	15.002		700	360	258	1,318	1,625
	5090	20' opening		1.45	22.069		935	535	380	1,850	2,275
	5100	10' high, 12' opening		1.31	24.427		800	590	420	1,810	2,250
	5110	20' opening		1.03	31.068		1,200	750	535	2,485	3,075
	5120	12' high, 12' opening		1.05	30.476		1,175	735	525	2,435	3,000
	5130	20' opening		.85	37.647		1,500	910	650	3,060	3,750
	5190	For aluminized steel add					20%				
	7001	Snow fence on steel posts 10' O.C., 4' high	B-1	500	.048	L.F.	1.56	1.10		2.66	3.44
530	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.	2.49	1.10		3.59	4.47
	0050	4' high		400	.060		2.83	1.38		4.21	5.25
	0100	6' high		200	.120		3.44	2.75		6.19	8.10
	0150	Add for gate 3' wide, 1-3/8" frame, 3' high		12	2	Ea.	37.50	46		83.50	113
	0170	4' high		10	2.400		43	55		98	134
	0190	6' high		10	2.400		59	55		114	152
	0200	Add for gate 4' wide, 1-3/8" frame, 3' high		9	2.667		42	61		103	142
	0220	4' high		9	2.667		47.50	61		108.50	148
	0240	6' high		8	3		55.50	69		124.50	169
	0350	Aluminized steel, 11 ga. wire, 3' high		500	.048	L.F.	3.23	1.10		4.33	5.30
	0380	4' high		400	.060		4.15	1.38		5.53	6.75
	0400	6' high		200	.120		5.85	2.75		8.60	10.75
	0450	Add for gate 3' wide, 1-3/8" frame, 3' high		12	2	Ea.	45	46		91	122

15120 | Piping Specialties

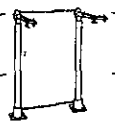
			CREW	DAILY OUTPUT	LABOR-HOURS	UNIT	2000 BARE COSTS MAT.	LABOR	EQUIP.	TOTAL	TOTAL INCL O&P	
820	1000	Flanged, 150 lb., 1-1/2" pipe size	1 Stpi	11	.727	Ea.	305	24.50		329.50	370	820
	1020	2" pipe size	"	8	1		390	33.50		423.50	480	
	1030	2-1/2" pipe size	Q-5	5	3.200		505	96.50		601.50	700	
	1040	3" pipe size		4.50	3.556		620	107		727	845	
	1060	4" pipe size		3	5.333		945	161		1,106	1,275	
	1100	6" pipe size	Q-6	3	8		2,500	250		2,750	3,125	
	1106	8" pipe size	"	2.60	9.231		3,900	289		4,189	4,725	
	1500	For 300 lb rating, add					40%					
840	0010	**STRAINERS, Y TYPE** Iron body										840
	0050	Screwed, 250 lb., 1/4" pipe size	1 Stpi	20	.400	Ea.	6.65	13.40		20.05	28	
	0070	3/8" pipe size		20	.400		6.30	13.40		19.70	27.50	
	0100	1/2" pipe size		20	.400		6.65	13.40		20.05	28	
	0140	1" pipe size		16	.500		10.75	16.75		27.50	37.50	
	0160	1-1/2" pipe size		12	.667		17.75	22.50		40.25	53.50	
	0180	2" pipe size		8	1		27.50	33.50		61	80.50	
	0220	3" pipe size	Q-5	11	1.455		151	44		195	233	
	0240	4" pipe size	"	5	3.200		255	96.50		351.50	425	
	0500	For galvanized body, add					50%					
	1000	Flanged, 125 lb., 1-1/2" pipe size	1 Stpi	11	.727	Ea.	86	24.50		110.50	132	
	1020	2" pipe size	"	8	1		64	33.50		97.50	121	
	1040	3" pipe size	Q-5	4.50	3.556		84.50	107		191.50	255	
	1060	4" pipe size	"	3	5.333		155	161		316	415	
	1080	5" pipe size	Q-6	3.40	7.059		242	221		463	600	
	1100	6" pipe size	"	3	8		295	250		545	705	
	1500	For 250 lb rating, add					20%					
	2000	For galvanized body, add					50%					
	2500	For steel body, add					40%					
920	0010	**VENTURI FLOW** Measuring device										920
	0050	1/2" diameter	1 Stpi	24	.333	Ea.	105	11.15		116.15	133	
	0120	1" diameter		19	.421		94	14.10		108.10	125	
	0140	1-1/4" diameter		15	.533		134	17.85		151.85	174	
	0160	1-1/2" diameter		13	.615		140	20.50		160.50	185	
	0180	2" diameter		11	.727		166	24.50		190.50	220	
	0220	3" diameter	Q-5	14	1.143		335	34.50		369.50	420	
	0240	4" diameter	"	11	1.455		375	44		419	480	
	0280	6" diameter	Q-6	3.50	6.857		660	214		874	1,050	
	0500	For meter, add					1,175			1,175	1,300	
940	0010	**WATER SUPPLY METERS**										940
	2000	Domestic/commercial, bronze										
	2020	Threaded										
	2060	5/8" diameter, to 20 GPM	1 Plum	16	.500	Ea.	66.50	16.65		83.15	98.50	
	2080	3/4" diameter, to 30 GPM		14	.571		115	19		134	156	
	2100	1" diameter, to 50 GPM		12	.667		157	22		179	206	
	2300	Threaded/flanged										
	2340	1-1/2" diameter, to 100 GPM	1 Plum	8	1	Ea.	485	33.50		518.50	585	
	2360	2" diameter, to 160 GPM	"	6	1.333	"	645	44.50		689.50	775	
	2600	Flanged, compound										
	2640	3" diameter, 320 GPM	Q-1	3	5.333	Ea.	2,900	160		3,060	3,450	
	2660	4" diameter, to 500 GPM use 173.045 on spreadsheet		1.50	10.667		4,525	320		4,845	5,450	
	2680	6" diameter, to 1,000 GPM		1	16		6,500	480		6,980	7,900	
	2700	8" diameter, to 1,800 GPM		.80	20		12,800	600		13,400	15,000	

15140 | Domestic Water Piping

0	0010	**BACKFLOW PREVENTER** Includes valves										100
	0020	and four test cocks, corrosion resistant, automatic operation										

15410 | Plumbing Fixtures

			CREW	DAILY OUTPUT	LABOR-HOURS	UNIT	2000 BARE COSTS MAT.	LABOR	EQUIP.	TOTAL	TOTAL INCL O&P	
040	0010	**FIXTURES** Includes trim fittings unless otherwise noted R15100-420										040
	0080	For rough-in, supply, waste, and vent, see add for each type										
	0120	For electric water coolers, see division 15413										
	0160	For color, unless otherwise noted, add				Ea.	20%					
200	0010	**CARRIERS/SUPPORTS** For plumbing fixtures										200
	0500	Drinking fountain, wall mounted										
	0600	Plate type with studs, top back plate	1 Plum	7	1.143	Ea.	26.50	38		64.50	86.50	
	0700	Top front and back plate		7	1.143		33	38		71	93.50	
	0800	Top & bottom, front & back plates, w/bearing jacks		7	1.143		47.50	38		85.50	110	
	3000	Lavatory, concealed arm										
	3050	Floor mounted, single										
	3100	High back fixture	1 Plum	6	1.333	Ea.	128	44.50		172.50	208	
	3200	Flat slab fixture		6	1.333		149	44.50		193.50	231	
	3220	Paraplegic		6	1.333		136	44.50		180.50	217	
	3250	Floor mounted, back to back										
	3300	High back fixtures	1 Plum	5	1.600	Ea.	182	53		235	281	
	3400	Flat slab fixtures		5	1.600		185	53		238	284	
	3430	Paraplegic		5	1.600		191	53		244	291	
	3500	Wall mounted, in stud or masonry										
	3600	High back fixture	1 Plum	6	1.333	Ea.	75.50	44.50		120	150	
	3700	Flat slab fixture	"	6	1.333	"	96.50	44.50		141	173	
	4600	Sink, floor mounted										
	4650	Exposed arm system										
	4700	Single heavy fixture	1 Plum	5	1.600	Ea.	298	53		351	405	
	4750	Single heavy sink with slab		5	1.600		201	53		254	300	
	4800	Back to back, standard fixtures		5	1.600		230	53		283	335	
	4850	Back to back, heavy fixtures		5	1.600		268	53		321	375	
	4900	Back to back, heavy sink with slab		5	1.600		268	53		321	375	
	4950	Exposed offset arm system										
	5000	Single heavy deep fixture	1 Plum	5	1.600	Ea.	203	53		256	305	
	5100	Plate type system										
	5200	With bearing jacks, single fixture	1 Plum	5	1.600	Ea.	271	53		324	380	
	5300	With exposed arms, single heavy fixture		5	1.600		350	53		403	460	
	5400	Wall mounted, exposed arms, single heavy fixture		5	1.600		126	53		179	220	
	6000	Urinal, floor mounted, 2" or 3" coupling, blowout type		6	1.333		136	44.50		180.50	216	
	6100	With fixture or hanger bolts, blowout or washout		6	1.333		96.50	44.50		141	173	
	6200	With bearing plate		6	1.333		108	44.50		152.50	186	
	6300	Wall mounted, plate type system		6	1.333		97	44.50		141.50	173	
	6980	Water closet, siphon jet										
	7000	Horizontal, adjustable, caulk										
	7040	Single, 4" pipe size	1 Plum	6	1.333	Ea.	205	44.50		249.50	293	
	7050	4" pipe size, paraplegic		6	1.333		205	44.50		249.50	293	
	7060	5" pipe size		6	1.333		271	44.50		315.50	365	
	7100	Double, 4" pipe size		5	1.600		385	53		438	500	
	7110	4" pipe size, paraplegic		5	1.600		205	53		258	305	
	7120	5" pipe size		5	1.600		271	53		324	380	
	7160	Horizontal, adjustable, extended, caulk										
	7180	Single, 4" pipe size	1 Plum	6	1.333	Ea.	205	44.50		249.50	293	
	7200	5" pipe size		6	1.333		365	44.50		409.50	470	
	7240	Double, 4" pipe size		5	1.600		277	53		330	385	
	7260	5" pipe size		5	1.600		365	53		418	485	
	7400	Vertical, adjustable, caulk or thread										
	7440	Single, 4" pipe size	1 Plum	6	1.333	Ea.	242	44.50		286.50	335	
	7460	5" pipe size		6	1.333		305	44.50		349.50	400	
	7480	6" pipe size		5	1.600		360	53		413	475	
	7520	Double, 4" pipe size		5	1.600		420	53		473	545	



17100 | S.F., C.F. and % of Total Costs

17100 | S.F. & C.F. Costs

				UNIT	UNIT COSTS			% OF TOTAL			
					1/4	MEDIAN	3/4	1/4	MEDIAN	3/4	
910	2900	Electrical	R17100 -100	S.F.	5.45	7.35	14.95	8%	10%	12.40%	910
	3100	Total: Mechanical & Electrical		↓	14	20.90	42.95	22.90%	26.60%	27.50%	
940	0010	**TOWN HALLS** City Halls & Municipal Buildings		S.F.	69.35	87.65	114				940
	0020	Total project costs		C.F.	5.20	7.25	9.70				
	2720	Plumbing		S.F.	2.47	5.10	8.45	4.20%	6.10%	7.90%	
	2770	Heating, ventilating, air conditioning			5.24	10.40	15.20	7%	9%	13.50%	
	2900	Electrical			6.25	8.40	11.90	8.20%	9.50%	11.70%	
	3100	Total: Mechanical & Electrical		↓	22	22.85	29	22%	25.10%	30.40%	
970	0010	**WAREHOUSES** And Storage Buildings		S.F.	25.85	36.15	55.65				970
	0020	Total project costs		C.F.	1.30	2.12	3.52				
	0100	Site work		S.F.	2.59	5.30	8	6%	12.80%	19.80%	
	0500	Masonry			1.61	3.68	7.95	5%	7.70%	13.20%	
	1800	Equipment			.42	.90	5.05	1%	2.40%	6.50%	
	2720	Plumbing			.86	1.55	2.89	2.90%	4.80%	6.60%	
	2730	Heating, ventilating, air conditioning			.99	2.78	3.73	2.40%	5%	8.90%	
	2900	Electrical			1.53	2.88	4.78	5%	7.30%	10%	
	3100	Total: Mechanical & Electrical		↓	4.27	6.30	14.35	12.80%	18.40%	26.20%	
990	0010	**WAREHOUSE & OFFICES** Combination		S.F.	31.15	41.75	55.40				990
	0020	Total project costs		C.F.	1.62	2.36	3.50				
	1800	Equipment		S.F.	.55	1.07	1.65	1.20%	2.40%	2.70%	
	2720	Plumbing			1.20	2.07	3.27	3.60%	4.70%	6.30%	
	2770	Heating, ventilating, air conditioning			1.91	3.02	4.25	5%	5.60%	9.60%	
	2900	Electrical			2.11	3.11	4.88	5.70%	7.70%	10%	
	3100	Total: Mechanical & Electrical		↓	4.98	8.25	10.30	13.80%	18.60%	23%	

For information about Means Estimating Seminars, see yellow pages 11 and 12 in back of book

See R17100-100 and City Cost Indexes in the Reference Section

Feature:

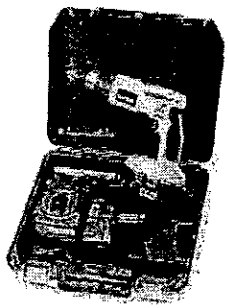
- Keyless chuck
- Variable-speed reversing (VSR)
- One and two speed ranges
- Ball and roller bearings
- Replaceable brushes
- Electric brake
- Anti-slip rubber handle
- UL Listed, CSA Certified

Replacement Parts Available
1-800-323-0620

DEWALT

Milwaukee

New



Pistol Grip
Cordless Drill
No. 4VX34

Pistol Grip
Hammer Drill
No. 3MJ98

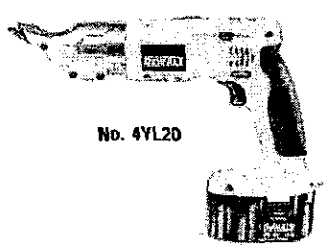
No. 3PW12

Chuck Size (in.)	Drill Speed (RPM)	Blows Per Min. (BPM)	Max. Torque (In./Lbs.)	Battery Packs Qty.	Battery Packs Replacement*	Battery Packs Recharge Time	Clutch Style	Handle Type	Includes	Tool Lgth. (In.)	Tool Wt. (Lbs.)	Mfr.	Mfr.'s Model	Stock No.	List	Each	Shpg. Wt.
12.0 VOLT CORDLESS HAMMER DRILL																	
3/8	0-1600	0-32,000	110	2	3LD01	1 hour	Adjustable Clutch	Pistol Grip	Batteries, Charger, Steel Carry Case, Side Handle	12 7/16	5⅝	Milw.	0422-6	1D585	$490.00	$280.00	7.2
14.4 VOLT CORDLESS HAMMER DRILLS																	
1/2	0-600 0-1750	0-6600 0-19,500	290	2	3MJ68	1 hour per pack	Adjustable Clutch	Pistol Grip	Batteries, Charger, Plastic Carry Case	10	5.1	DeWalt	DW996K-2	3MJ98	444.00	239.00	13.0
1/2	0-600 0-1750	0-6600 0-19,500	290	2	3MJ68	1 hour	Adjustable Clutch	Pistol Grip	Vehicular Charger, Battery, Carry Case	10	5.1	DeWalt	DW996KV-2	4YL24	490.00	287.00	14.0
1/2	0-1450 0-450	0-19,500	350	2	4PD97	1 hour	Adjustable Clutch	T Handle	Battery, Charger, Plastic Carry Case	10¾	5.7	Milw.	0514-22	4YJ62	436.00	263.25	12.0
1/2	0-450 0-1250	0-26,000	350	2	4PD97	1 hour per pack	Adjustable Clutch	Pistol Grip	Battery, Charger, Plastic Carry Case	11½	4	Milw.	0513-21	3PW12	436.00	219.00	17.0
18.0 VOLT CORDLESS HAMMER DRILLS																	
1/2	0-650 0-1850	0-7150 0-20,350	325	2	4LF48	1 hour	Adjustable Clutch	Center Grip	Battery, Charger, Plastic Carry Case	10	5.6	DeWalt	DW997K-2	4VX33	510.00	290.75	13.0
1/2	0-650 0-1850	0-7150 0-20,350	325	2	4LF48	1 hour	Adjustable Clutch	Pistol Grip	Battery, Charger, Plastic Carry Case	10	5.6	DeWalt	DW998K-2	4VX34	510.00	290.75	13.0
SDS Drive System	0-850	0-3900	—	1	4PD99	1 hour	3/4" Rotary Hammer	D Handle	Battery, Charger, Plastic Carry Case	17½	7	Milw.	5361-20	4PF70	810.00	494.50	16.0
1/2	0-500 0-1600	0-20,800	400	0	48-11-2230 Not Included	1 hour	Adjustable Clutch	Pistol Grip	Tool Only	12¾	5.9	Milw.	0523-20	4YJ67	250.00	151.50	11.0
1/2	0-500 0-1600	0-20,800	800	2	48-11-2230	1 hour	Adjustable Clutch	Pistol Grip	Battery, Charger, Plastic Carry Case	12¾	5.9	Milw.	0523-22	4YJ68	565.00	341.00	14.0
1/2	0-500 0-1600	0-20,800	400	0	48-11-2230 Not Included	1 hour	Adjustable Clutch	T Handle	Tool Only	12¾	5.9	Milw.	0524-20	4YJ69	250.00	151.50	4.3
1/2	0-500 0-1600	0-20,800	400	2	48-11-2230	1 hour	Adjustable Clutch	T Handle	Battery, Charger, Plastic Carry Case	12¾	5.9	Milw.	0524-22	4YJ70	565.00	341.00	14.0

(*) See Index under Drill, Batteries for full specifications on Replacement Batteries.

DEWALT

New



No. 4YL20

18 GA. SWIVEL SHEAR

The double cutting action cleanly cuts up to 18 gauge sheet metal without distortion. The 7/32" waste curl leaves both sides of the cut straight with no need to file or de-burr.

- Two batteries, one hour charger & carrying case
- Powered by DeWalts 12V & 14.4V system of batteries
- 10 surface Ft. per min.
- Head swivels 360° for cutting convenience
- Cuts 7/32" strip which continuously curls out of the cutter's way
- Min. radius 5" In.

Ordering Data

Type	Volts	Gauge Cap. Stainless Steel		DeWalt Model	Stock No.	List	Each	Shpg. Wt.
Cordless Shear	12	20	18	DW940K-2	4YL20	$500.00	$276.00	10.0
Cordless Shear	14.4	20	18	DW941K-2	4YL22	540.00	299.00	13.0

DUAL FUNCTION 12V LIGHT WITH PHOTOCELL FOR BEAR-A-CADE

Rugged, reliable unit provides trouble-free, long life operation in hot and/or cold weather. Amber 7" lens features dual function for both steady-burn and/or flashing triple switch. 55-75 FMP rate. Powered by two 6 volt lantern batteries (not included). Photocell conserves battery life and eliminates manual operation. Case constructed of copolymer polypropylene with UV stabilizers. Comes with theft resistant, galvanized 5½" bolt, protector, special wrench and key. Compliments Bear-A-Cade brand barricades Nos. 3JP35 and 3JP36, sold below. (#2000).

No. 3JP33. Shpg. wt. 2.7 lbs. List $40.64. Each **$30.10**; Lots 10.....**$28.60**

Women-Owned Business

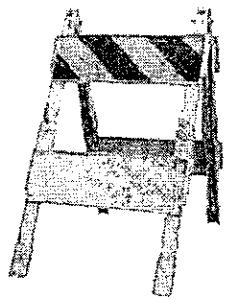
Meets MUTCD Standards

TYPE I AND II PLASTIC BARRICADES

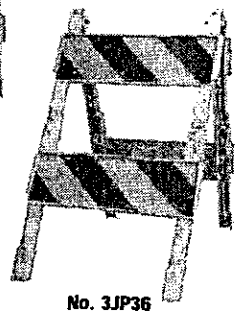
- Durable
- Recyclable
- Expandable
- Economical
- Interchangeable
- Stackable

Impact-resistant, plastic barricades are designed to snap together easily and break away when hit, yielding less damage to persons, property and barricade itself. Cost efficient interchangeable modular panels allow replacement of single module, not entire barricade. High density polyethylene construction guarantees long wear. UV antioxidant additives resist sun damage. Washable, non-rusting. Push-button stabilizer arms help prevent closing, "walking", or toppling over in heavy winds. Holes at the bottom of legs allow for placement of anchoring stakes.

Barricades feature 3M 8 x 24" engineer grade reflective orange and white, left and right striped sheeting, meeting State of California requirements. Type I has sheeting on top panel only; Type II has sheeting on both top and bottom panels. Panels have reinforced bolt holes strategically placed for easy installation of signs. Accommodates industry standard flashing light with 5½" bolt (No. 3JP33, order separately above). Stacking lugs secure barricades in place for shipping and storage. Designed to accept extension rails. Bear-A-Cade brand.



No. 3JP35 Type I Barricade



No. 3JP36 Type II Barricade

Passed State of California Dept. of Transportation Tests for Use on State Highways

Description	Bear-A-Cade Model	Stock No.	List	Each	Lot/ 6	Shpg. Wt.
Type I Barricade	W8X4E2	3JP35	$93.02	$68.90	$65.46	18.0
Type II Barricade	W8X4E4	3JP36	104.09	77.10	73.25	18.0

MINI-CADE "CAUTION" SIGN STAND

- Durable
- Recyclable
- Economical

Bear-A-Cade's mini-cade (cub) is bright yellow and made of recycled plastic materials. Provides a "24 hour" night and day visibility safety sign stand or warning device to alert of hazardous areas. Bold, black "CAUTION" lettering on 3M reflective sheeting. Can be used indoors or outdoors in various situations at home or on the job. High density polyethylene guarantees long wear. UV antioxidant additives resist sun damage. Washable, no rusting or warping. Reinforced bolt holes for easy installation of multi-purpose signage. "Cub" stand folds flat for easy storage. Bear-A-Cade brand (Y8X2E2).

No. 3JP34. Shpg. wt. 9.0 lbs. List .....$58.79 Each **$43.55**; Lots 6.....**$41.37**

No. 3JP34 Mini-Cade Sign Stand

art Contains:
Items = 0 Total = $0.00

lastic Products
Select a Category---------

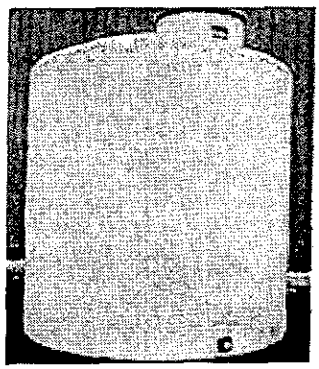
afety Products
Select a Category---------

esources
- Text Product Index
- FREE Catalogs
- Contact Information
- Request a Quote
- Express Answers
- Knowledgebase

r Account
- reate an Account
- View Order Status
- View Account Profile

Express Order Form
Item
Qty
Bulk Express Order Form

-Mail Center
Select an Email----------



Large Vertical Polyethylene Storage Tanks

Medium density natural polyethylene and provides an easy-to-see liquid le Tanks have molded in tie-down grooves or lugs. Heavy duty construction, lightweight for easy moving. The polyethylene is UltraViolet Stabilized to provide resistance to sunlight. Many uses including chemicals, herbicides, liquid fertilizers and more. Most tanks come equipped with 18" man way, wi 22" Cam Lock Cover and a 2" FNPT polypropylene fitting with EPDM gaske the base of the tank. 3 year warranty from the date of manufacture. Not designed to be used as a pressurized tank. Tank cover has a vent hole. Me FDA standards for potable (drinking) water. #8618 fits standard pick-up tr Max. temp. 140°F. Cap. to 2150 gallons. Max. specific gravity 1.5.

Discounts Available Per Item	
Qty 2	5% off
Qty 4	10% off
Qty 12	15% off

Other Information

Catalog Page Number: P-71

Manufacturer: Meese

This product is available in following variations:

Item No.	Description	Capacity	Size	Sold By	In Stock	List Price	Qty
8616	Vertical Tank With Groove No Manhole	65 Gallon	22 1/5 x 46	Each	Drop Ship	$153.84	0
8622	Vertical Tank With Groove No Manhole	175 Gallon	35 1/2 x 52 1/2	Each	Drop Ship	$182.75	0
8621	Vertical Tank With Groove And Manhole	300 Gallon	35 x 86 1/2	Each	Drop Ship	$280.84	0
8618	Vertical Tank With Groove And Manhole	465 Gallon	63 x 50 1/2	Each	Drop Ship	$438.67	0
8619	Large Vertical Tank With Groove And Manhole	500 Gallon	63 x 52 1/2	Each	Drop Ship	$414.50	0
8631	Large Vertical Tank With Groove And Manhole	500 Gallon	48 x 75 1/2	Each	Drop Ship	$388.09	0
8635	Large Vertical Tank With Lugs And Manhole	1000 Gallon	66 x 80 1/2	Each	Drop Ship	$566.17	0
8632	Large Vertical Tank With Groove And Manhole	1150 Gallon	86 x 56 1/2	Each	Drop Ship	$551.92	0
8636	Large Vertical Tank With Lugs And Manhole	1500 Gallon	66 x 114 1/2	Each	Drop Ship	$720.59	0
8633	Large Vertical Tank With Groove And Manhole	1700 Gallon	86 x 77 1/2	Each	Drop Ship	$695.14	0
8634	Large Vertical Tank With Groove And Manhole	2150 Gallon	86 x 98 1/2	Each	Drop Ship	$902.47	0

If you didn't find what you need, click here.

1390 Neubrecht Rd.
Lima, Ohio 45801-3196
1-800-809-4217 Fax 1-800-854-5498

ADVANTAGE
LEISURE PRODUCTS INC.
RESIDENTIAL ● COMMERCIAL
HOT TUBS ● POOLS ● PONDS ● SAUNAS

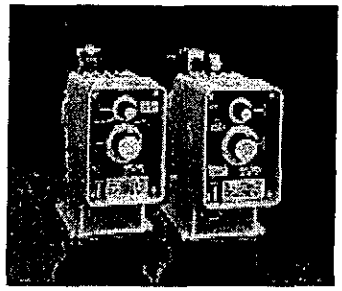
roduct Catalogue

OME
lick on + / - to expand/collapse
enu respectively
⊞ Unicel Replacement Filters
⊞ Cartridge Filters
⊞ Pumps & Motors
⊞ Electrical
⊞ Chemicals
⊞ Heating
⊞ Plumbing
⊞ Maintenance
⊞ Covers
⊞ Spa Parts & Accessories
⊞ Spa Toys, Games & Accessories
⊞ Pool Toys, Games & Accessories
⊞ ools
⊞ ond Supplies & Equipment
⊞ Cross Reference Charts
⊟ Terms and Conditions

Menu Category: LMI Chemical Injection Pumps

(See page 3)

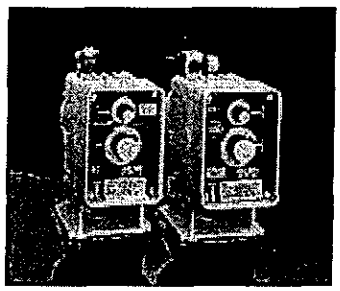
"A" Series 14 GPD, 250 PSI Injection Pump
115 Volt, 1/4" Tube & includes 4 Function VL.



Stock Number: A141-352SI

List Price: $1,285.50

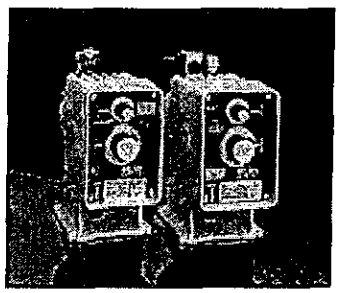
"A" Series 24 GPD, 110 PSI Injection Pump
115 Volt, 3/8" Tube & includes 4 Function VL.



Stock Number: A151-392SI

List Price: $1,305.00

"A" Series 48 GPD, 50 PSI Injection Pump
115 Volt, 3/8" Tube & includes 4 Function VL.



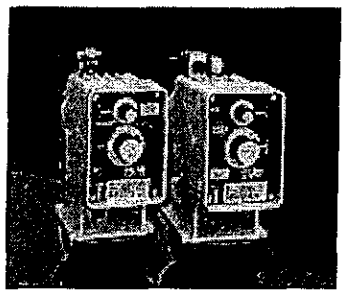
Stock Number: A161-362SI

List Price: $1,357.50

"B" Series 60 GPD, 110 PSI Injection Pump
115 Volt, 3/8" Tube & Includes 4 Function VL

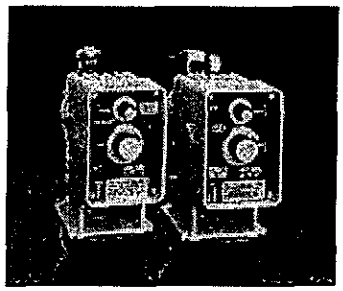
Stock Number: B121-392SI

List Price: $1,839.00



"B" Series 108 GPD, 50 PSI Injection Pump
115 Volt, 3/8" Tube & Includes 4 Function VL

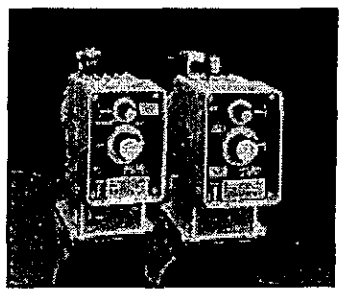
Stock Number:
B131-362SI



List Price:
$1,839.00

"B" Series 108 GPD, 50 PSI Injection Pump
115 Volt, 3/8" Tube

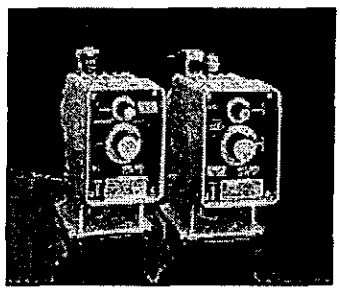
Stock Number:
B131-79



List Price:
$1,780.00

"C" Series 60 GPD, 150 PSI Injection Pump
115 Volt, 3/8" Tube & Includes 4 Function VL

Stock Number:
C111-362SI

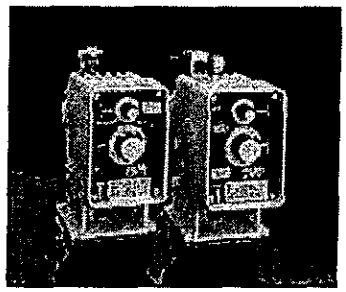


List Price:
$2,300.00

"C" Series 108 GPD, 100 PSI Injection Pump
115 Volt, 3/8" Tube & Includes 4 Function VL

Stock Number:
C121-362SI

List Price:
$2,300.00

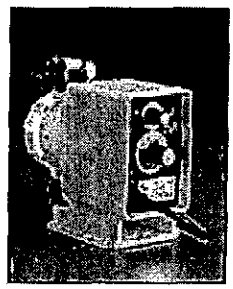


"P" Series 5 GPD, 150 PSI Injection Pump
115 Volt, 1/4" Tube & Includes 4 Function VL

Stock Number:
P121-352SI

List Price:
$978.00

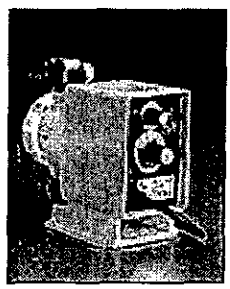
LMI Chlorine Injection Pump



"P" Series 14 GPD, 250 PSI Injection Pump
115 Volt, 1/4" Tube & Includes 4 Function VL

Stock Number:
P041-352SI

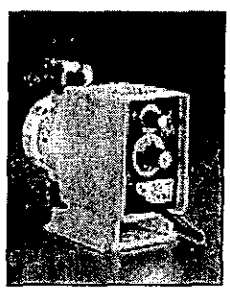
List Price:
$882.00



"P" Series 14 GPD, 250 PSI Injection Pump
115 Volt, 1/4" Tube & Includes 4 Function VL

Stock Number:
P141-352SI

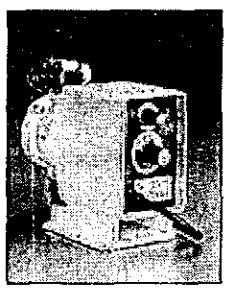
List Price:
$1,020.00



"P" Series 24 GPD, 110 PSI Injection Pump
115 Volt, 1/4" Tube & Includes 4 Function VL

Stock Number:
P051-392SI

List Price:
$900.00



SCHONSTEDT INSTRUMENT COMPANY

Products

For additional information on individual products, click the appropriate link on the left navigation bar. Click the **ORDER** button to order any of these products using our secure online store. At anytime you can view your shopping cart or checkout using the **"View Cart/Checkout"** buttons below.

All prices are in US dollars

*Free shipping is UPS Ground Service to Domestic USA Only.

All shipping costs calculated are for domestic USA only, all shipping charges to any other country you will be notified via e-mail of charges before your credit card is charged.

Magnetic Locators

View Cart / Checkout

	Part No.	Description	Price
Order	GA-52Cx	GA-52Cx Magnetic Locator with Case	$860.00
Order	GA-72Cd	GA-72Cd Metered Magnetic Locator with Case	$925.00
Order	GA-92XTi	GA-92XTi Indicator Magnetic Locator with Case	$910.00
Order	GA-92XTd	GA-92XTd DiMagnetic Locator with Case	$985.00
Order	MAC-51Bx	MAC-51Bx Magnetic and Pipe & Cable Locator with Case	$2,095.00

Go to Magnetic Locators Parts & Accessories

Pipe & Cable Locators

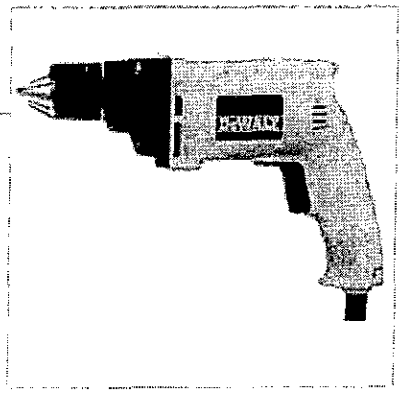
View Cart / Checkout

	Part No.	Description	Price
Order	TMS-001	TraceMaster Pipe & Cable Locator	$2,795.00
Order	TMS-001-PF	TraceMaster ***Passive Only*** Pipe & Cable Locator	$1,495.00
Order	TMS-001-SF	TraceMaster ***Single Frequency*** Pipe & Cable Locator (Call factory to specify frequency)	$2,145.00
Order	MAC-51Bx	MAC-51Bx Magnetic and Pipe & Cable Locator with Case	$2,095.00

Go to Pipe & Cable Locators Parts & Accessories

All returning products must be returned within 7 business days. You must contact Schonstedt Sales dept or e-mail to orders@schonstedt.com as soon as possible. You will be notified via email with further instructions on returning products. Credits will be processed upon receipt of returned merchandise in new and unused

DEWALT



DeWalt 6.7 amp Corded Drill, Variable Speed Keyless Hand Drill

Features cut steel helical gearing, Ball Bearings and 0-1200 rpm variable speed. Drill has a Jacob® hand-turn Keyless Chuck with 3/8 in. capacity. Also features Reversibility and pistol grip handle.

Sears item #00926997000
Mfr. model #DW222

$99.99
Rebate details

Add to cart

Print info on this page

Learn more with our Buying Guide

View larger image
Product images may differ from actual product appearance.

FREE SHIPPING with mail-in rebate (provided in email receipt). This item typically leaves the warehouse within 2 business days. Learn more about delivery and availability.

Buy Online, Pick Up In Store

We'll match any price plus ...

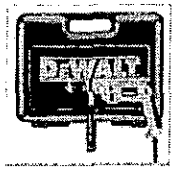
Sears Card®
- Only $10 per month on your Sears Card®

Learn more

Full product description | Product specs | More images | Optional items | Service and satisfaction | Delivery and availability

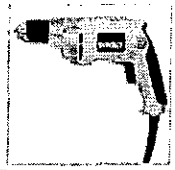
Sorry, no additional description is available for this item.

Other items to consider



$149.99
Rebate details

DeWalt 7.8 amp Corded Drill Kit, Variable Speed Keyless



$139.99
Rebate details

DeWalt 7.0 amp Corded Drill, Variable Speed Reversible

Print info on this page

Not all products are available at every Sears store.
Online prices and promotions are for the continental U.S. only.

SEARS
Good life. Great price.

Search results for **"makita rechargeable drill"**

You have 7 results

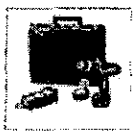
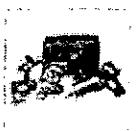
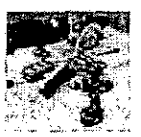
Narrow your results with the links below

Rechargeable Drill

Tools

Portable Power Tools

- Drills, Cordless (5)
- Cordless Combo Kits (2)

Brand	Product	Price	Compare 2-4 items
 Makita	**Makita 18.0 volt Cordless Drill/Driver Kit, MFORCE™** Sears item #00926758000 Mfr. model #6347DWDE	**$229.99** Rebate details	Add to cart ★ Buy online. Pick up in store.	☐
 Makita	**Makita 14.4 volt Cordless Drill, MFORCE™** Sears item #00926757000 Mfr. model #6337DWDE	**$199.99** Rebate details	Add to cart ★ Buy online. Pick up in store.	☐
 Makita	**Makita 12.0 volt Cordless Drill/Driver** Sears item #00926742000 Mfr. model #6217DWDE	**$169.99** Rebate details	Add to cart	☐
 Makita	**Makita 18.0 volt Cordless Drill Combo Kit with Multiple Tools** Sears item #00926740000 Mfr. model #DK1032DL	**$829.99** Rebate details	Add to cart	☐
 Makita	**Makita 18.0 volt Cordless Combo Kit, MFORCE™ with Multiple Tools** Sears item #00926741000 Mfr. model #DK1052DL	**$499.99** Rebate details	Add to cart	☐
 Makita	**Makita 12.0 volt Cordless Drill/Driver Kit** Sears item #00927397000 Mfr. model #6227DWE	**$119.99** Rebate details	Add to cart ★ Buy online. Pick up in store.	☐
 Makita	**Makita 9.6 volt Cordless Drill/Driver Kit, 3/8 in. Chuck** Sears item #00927396000 Mfr. model #6226DWE	**$99.99** Rebate details	Temporarily out of stock for delivery ... Ways to buy ★ Buy online. Pick up in store.	☐

SEARS
Good life. Great price.

Close window

Kenmore

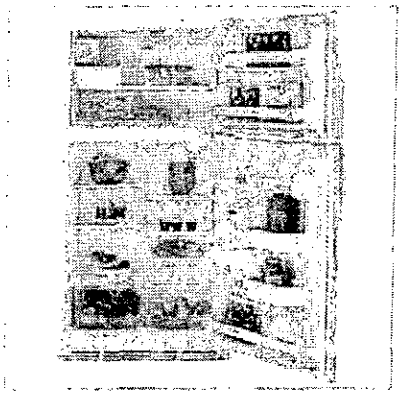
$499.88
Reg. $649.99
Save $150.11
While quantities last

This item is typically delivered within 7-10 business days.

Buy Online, Pick Up In Store

We'll match any price plus ...

Sears Card®
- Save with 0% financing on this item until May, 2004.
- Only $12 per month with your Sears Card®



Product images may differ from actual product appearance.

Kenmore White-on-white 20.9 cu. ft. Top Freezer Refrigerator with Factory Installed Ice Maker

Roomy refrigerator with all the extras so your groceries remain easy-to-reach and just as fresh as the day you bought them. 5 glass shelves plus 2 standard crispers and ice maker.

Sears item #04673152000
Mfr. model #73152
Sears exclusive. This item is only available at Sears.

ENERGYGUIDE

Full product description

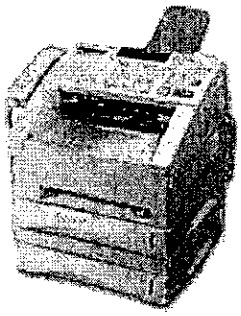
- Up-front temperature controls
- Ice maker
- Foam-in-place insulation
- Double tub stress box construction
- Reversible doors

Also available in ...

Bisque-on-Bisque

Not all products are available at every Sears store.
Online prices and promotions are for the continental U.S. only.

Close window



Brother IntelliFax 5750e Laser Fax Machine

* 33.6K bps Super G3 Fax Modem
* Fast, up to 12 ppm Laser Engine for printing of copies and faxes
* 4MB Dual Access Memory with Super Quick-Scan
* Multi-Copying (up to 99) with enlargement and reduction
* Up to 50 page Auto Document Feeder
* Dual 250 Sheet Letter/Legal Paper Cassette (for 500 total sheet capacity)
* Broadcasting (up to 182 locations)
* Printer cable NOT included

✓ Don't Forget Cartridges or Toner (Select Below)

* 1 Year Limited Warranty (Warranty Information)

Compare with other Fax Machines:

Comparison Chart

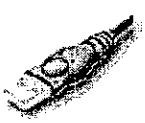
More Info

Product Name Description	Unit	Expected Delivery	Price	Quantity Desired
Brother IntelliFax 5750e Laser Fax Machine Item # 20232295 , Style # PPF5750E	EA	3-7 Business Days	$999.98	

Extended Warranty: Protect your purchase for pennies a day!
No deductible, no unexpected costs!

1-Year Extended Warranty For Peripherals & Electronics Between $400-$999.99 (Details) Item # 20225034	$69.99	
2-Year Extended Warranty For Peripherals & Electronics Between $400-$999.99 (Details) Item # 20225016	$99.99	
3-Year Extended Warranty For Peripherals & Electronics $1000-$3999.99 (Details) Item # 20225150	$249.99	

Related Products to Brother IntelliFax 5750e Laser Fax Machine



Belkin USB A/B Gold Cables USB A/B Device Cable Gold (6ft.) Item # 02236413 , Style # F3U133-06-GLD	EA	1 Business Day	$24.99	

Belkin IEEE 1284 Printer Cables Gold Series IEEE 1284 6' Cable Item # 02213731 , Style # F2A046-06-GLD	EA	1 Business Day	$29.99	
Brother Fax Machine Supplies Brother TN430 Toner Cartridge for HL1240, HL1440, MFC2500, MFC8300, MFC8500, MFC8600, MFC9600, MFC	EA	1 Business	$49.49	

Did you know...

1. To obtain a free copy o the warranty information for any product at OfficeMax.com, please contact our Customer Service department.

2. OfficeMax.com makes it easy to find electronics that match your needs by offering helpful comparison charts. Compare the features and prices for 18 product categories, including printers, CD-RW drives, PDAs, digital cameras and more!

3. Leasing office equipment through OfficeMax and American Express can bring you a world of benefits. Learn more about this new program today!

4. Help the environment by recycling your inkjet printer cartridges. Ask your local OfficeMax store about recycling programs in your area.

36 search results for "time clock"

Select from these categories:
Beverage & Breakroom Supplies (22) **Time Clocks & Cards (14)**

	Product Name Description	Unit	Expected Delivery	Price	Quantity Desired
Beverage & Breakroom Supplies					
	Day and Date Wall Clock Wall Clock 13.5" Black Frame. Item # 20157063, Style # 12400416	EA	1 Business Day	$12.99	
	Seth Thomas Taz Wall Clock Black Taz Wall Clock Item # SET33139, Style # SET33139	EA	3 Business Days	$17.29	
	Seth Thomas Quartz Wall Clocks Rosewood 18" Round Wall Clock Item # SET3020, Style # SET3020	EA	3 Business Days	$63.79	
	Berkshire Oak 13" Round Wall Clock Item # SET2658, Style # SET2658	EA	3 Business Days	$59.29	
	Seth Thomas LCD Wall Clock LCD Wall Clock Item # SET2640, Style # SET2640	EA	3 Business Days	$90.19	
	More Like This				
Time Clocks & Cards					
	Acroprint PayTime Badge System Time Clock Item # 07111742, Style # ACPPAYTIME	EA	1 Business Day	$499.99	
	Acroprint Electric Time Recorder Automatic Time Clock Recorder Item # 07019219, Style # AC 150 NR4	EA	1 Business Day	$339.99	
	Lathem Electronic Time Clock Electronic Time Clock Item # 20388536, Style # 5000EP	EA	3 Business Days	$387.09	
	Lathem Time / Attendance System Electronic Time Clock/ Attendance				

Item Detail

Log Off
My Account ▸
Order Information ▸
Product Ordering ▸
Product Literature
Policies ▸
MSDS
Customer Service ▸
Contact Us

Back New Search

sensION Electrochemical Meters

Contemporary, rugged, and absolutely guaranteed to meet your expectations for performance and reliability, Hach's new sensION electrochemical products offer significant technological improvements, highly intuitive software, and an abundance of time-saving features designed to simplify and perfect pH, ISE, conductivity, and dissolved oxygen testing.

Like all Hach instruments, sensION meters are designed for maximum simplicity, high value, and precision results. Each meter is a complete analysis package supplied with: a robust new electrode, buffers and beakers, easy-to-follow, illustrated procedures, and personalized service and technical support.

Catalog #: 5465013
Price: 1150.00

sensION 156 Portable pH/Dissolved Oxygen Meter (with conventional pH probe and dissolved oxygen probe)

Quantity: 1 Add to Order Show Order

HACH

Item Detail

Log Off
My Account ▸
Order Information ▸
Product Ordering ▸
Product Literature
Policies ▸
MSDS
Customer Service ▸
Contact Us

Back New Search

Color Disc, Test Kits

Our unique color discs feature a continuous-gradient color wheel for fast, accurate comparisons. Simply rotate the color wheel to obtain a color match with the reacted sample. Typical accuracy is ± 10%, subject to individual color perception.

Catalog #: 146400
Price: 42.95

Test Kit Iron, Model IR-18, Medium Range 0-5 mg/L, Color Disc

Parameter	Test	Method	Range
Iron	Iron, medium range as Fe	1,10 Phenanthroline	0-5 mg/L

Quantity: 1 Add to Order Show Order View MSDS