

RESIDENCE INN

BY MARRIOTT

2345 MILL RD, ALEXANDRIA, VA

JULIA E. PHILLIPS

CONSTRUCTION MANAGEMENT



Appendix F: Constructed Wetland Greywater System

The following can be found in this Constructed Wetland Greywater System Appendix:

- Center for Sustainability Site Visit Pictures
- Environmental Protection Agency Definitions
- Greywater System Calculations
- Tank and Pump Cut Sheets
- Drawing P-103
- Virginia American Water Rates and Schedules



Plant Cleaning Tank



Aerobic Airtated Tanks



Papyrus and Elephant Ear Plants



Clarifying Tank



Close Up of Liner



Collection Tank – Suitable for sustaining fish



Cleaning and Clarifying Tanks with Plants



Collection Tank



Cleaning tank and Aerobic Tanks



Airation Gauge



Airator Pump



Aerobic Tank Vents



Fluorescent Lighting

Wetland Plants

Softstem bulrush and cattail are emergent aquatic plants. Emergent plants can stabilize the wetland bed surface, provide an attachment surface for microbes, insulate the bed, and assist in decomposition of pollutants. During the active growth period, plants are able to significantly reduce pollutants in the water by providing oxygen to the microbes in the root zone and consuming nutrients to build additional plant biomass. During the senescent phase, plants still contribute to the reduction of pollutants by providing oxygen to the microbes.

Softstem Bulrush was collected approximately one-half a mile from the test site. Bulrush can survive over a wide pH range of 5.4 to 7.5, and their adaptability is high. The Wyoming growth period for bulrush is approximately six months (spring to fall).

Broadleaf Cattail was collected from same site as the bulrush. The cattail growth period extends from April to August. Cattails can tolerate pH levels from 5.5 to 7.5. Studies indicate cattail is a good wetland plant for removing organic pollutants from the water. Cattail oxidizes the soil creating an aerobic environment.

Hydraulic Retention Time (HRT)

The HRT is a measurement of how long on average the water is in contact with the wetland. The HRT is equal to water volume divided by the flow rate. By plotting HRT v. pilot wetland treatment performance data, one can begin to size of a full-size treatment wetland (Table 6 and Figure 10).

Typically, pea gravel has a 30% porosity and hydraulic conductivity between 10^{-1} to 10^2 cm/sec. With 30% porosity the water is able to flow through the media. Sufficient pore space is available for microbes to attach to the surface area of the gravel and permit plant roots to expand.

The use of the small rock size has a number of advantages. (1) There is more surface area available on the media for treatment as compared to large rock. (2) Small void spaces are compatible with development of the roots and rhizomes of the vegetation. (3) It creates laminar flow conditions (*USAE WES-Constructed Wetlands Design*) (Table 7).

Figure 3-16. Typical wastewater pollutants of concern

Pollutant	Reason for concern
Total suspended solids (TSS) and turbidity (NTU)	In surface waters, suspended solids can result in the development of sludge deposits that smother benthic macroinvertebrates and fish eggs and can contribute to benthic enrichment, toxicity, and sediment oxygen demand. Excessive turbidity (colloidal solids that interfere with light penetration) can block sunlight, harm aquatic life (e.g., by blocking sunlight needed by plants), and lower the ability of aquatic plants to increase dissolved oxygen in the water column. In drinking water, turbidity is aesthetically displeasing and interferes with disinfection.
Biodegradable organics (BOD)	Biological stabilization of organics in the water column can deplete dissolved oxygen in surface waters, creating anoxic conditions harmful to aquatic life. Oxygen-reducing conditions can also result in taste and odor problems in drinking water.
Pathogens	Parasites, bacteria, and viruses can cause communicable diseases through direct/indirect body contact or ingestion of contaminated water or shellfish. A particular threat occurs when partially treated sewage pools on ground surfaces or migrates to recreational waters. Transport distances of some pathogens (e.g., viruses and bacteria) in ground water or surface waters can be significant.
Nitrogen	Nitrogen is an aquatic plant nutrient that can contribute to eutrophication and dissolved oxygen loss in surface waters, especially in lakes, estuaries, and coastal embayments. Algae and aquatic weeds can contribute trihalomethane (THM) precursors to the water column that may generate carcinogenic THMs in chlorinated drinking water. Excessive nitrate-nitrogen in drinking water can cause methemoglobinemia in infants and pregnancy complications for women. Livestock can also suffer health impacts from drinking water high in nitrogen.
Phosphorus	Phosphorus is an aquatic plant nutrient that can contribute to eutrophication of inland and coastal surface waters and reduction of dissolved oxygen.
Toxic organics	Toxic organic compounds present in household chemicals and cleaning agents can interfere with certain biological processes in alternative OWTs. They can be persistent in ground water and contaminate downgradient sources of drinking water. They can also cause damage to surface water ecosystems and human health through ingestion of contaminated aquatic organisms (e.g., fish, shellfish).
Heavy metals	Heavy metals like lead and mercury in drinking water can cause human health problems. In the aquatic ecosystem, they can also be toxic to aquatic life and accumulate in fish and shellfish that might be consumed by humans.
Dissolved inorganics	Chloride and sulfide can cause taste and odor problems in drinking water. Boron, sodium, chlorides, sulfate, and other solutes may limit treated wastewater reuse options (e.g., irrigation). Sodium and to a lesser extent potassium can be deleterious to soil structure and SWIS performance.

Source: Adapted in part from Tchobanoglous and Burton, 1991.

Table 3-7. Constituent mass loadings and concentrations in typical residential wastewater^a

Constituent	Mass loading (grams/person/day)	Concentration ^b (mg/L)
Total solids (TS)	115-200	500-880
Volatile solids	65-85	280-375
Total suspended solids (TSS)	35-75	155-330
Volatile suspended solids	25-60	110-265
5-day biochemical oxygen demand (BOD ₅)	35-65	155-286
Chemical oxygen demand (COD)	115-150	500-660
Total nitrogen (TN)	6-17	26-75
Ammonia (NH ₄)	1-3	4-13
Nitrites and nitrates (NO ₂ -N; NO ₃ -N)	<1	<1
Total phosphorus (TP) ^c	1-2	6-12
Fats, oils, and grease	12-18	70-105
Volatile organic compounds (VOC)	0.02-0.07	0.1-0.3
Surfactants	2-4	9-18
Total coliforms (TC) ^d	—	10 ⁸ -10 ¹⁰
Fecal coliforms (FC) ^d	—	10 ⁶ -10 ⁸

^aFor typical residential dwellings equipped with standard water-using fixtures and appliances.

^bMilligrams per liter; assumed water use of 60 gallons/person/day (227 liters/person/day).

^cThe detergent industry has lowered the TP concentrations since early literature studies; therefore, Sedlak (1991) was used for TP data.

^dConcentrations presented in Most Probable Number of organisms per 100 milliliters.

Source: Adapted from Bauer et al., 1979; Bennett and Linstedt, 1975; Laak, 1975, 1986; Sedlak, 1991, Tchobanoglous and Burton, 1991.

Table 3-8. Residential wastewater pollutant contributions by source^{a,b}

Parameter		Garbage disposal (gpcd) ^c	Toilet (gpcd) ^c	Bathing, sinks, appliances (gpcd) ^c	Approximate total (gpcd) ^c
BOD ₅	mean range % of total	18.0 10.9-30.9 (28%)	16.7 6.9- 23.6 (26%)	28.5 24.5-38.8 (45%)	63.2 (100%)
Total suspended solids	mean range % of total	26.5 15.8-43.6 (37%)	27.0 12.5- 36.5 (38%)	17.2 10.8-22.6 (24%)	70.7 (100%)
Total nitrogen	mean range % of total	0.6 0.2-0.9 (5%)	8.7 4.1- 16.8 (78%)	1.9 1.1-2.0 (17%)	11.2 (100%)
Total phosphorus ^d	mean range % of total	0.1 (4%)	1.6 (59%)	1.0 (37%)	2.7 (100%)

^aAdapted from USEPA, 1992.

^bMeans and ranges for BOD, TSS, and TN are results reported in Bennett and Linstedt, 1975; Laak, 1975; Ligman et al., 1974; Olsson et al., 1968; and Siegrist et al., 1976.

^cGrams per capita (person) per day.

^dThe use of low-phosphate detergents in recent years has lowered the TP concentrations since early literature studies; therefore, Sedlak (1991) was used for TP data.



JULIA E. PHILLIPS
CONSTRUCTION MANAGEMENT

Greywater Production vs. Demand

Hotels produce approximately 60 gallons per day of greywater for each typical 2 person room.
This translates to approximately 30 gallons per day per person.

Occupancy Rates:

* Assume 1 person in a Studio, 2 people in a 1 Bedroom, 4 people in a 2 Bedroom.

140 Studio Rooms = 140 People

33, 1 Bedroom = 66 People

8, 2 Bedroom = 32 People

Total = 238 People

* Assume 85% Occupancy including guests and employee water usage = 203 People

* Assume using 5.5 floors of water to recycle to all water closets = 83 people

* Assumes each person takes one (1) 10 minute shower per day. (Public and Private Shower)

* Assumes 3 flushes per person per day.

Equipment:

Shower → 2.5 gpm

Low Flow Water Closet → 1.6 g/flush

Production Per Person Per Day

10 minute Shower = 25 gpd

3 Flushes per Day = 4.8 gpd

Total Per Day = 29.8 gpd

Total Greywater Production from Showers = 2075 gpd
Total Greywater Consumption from Water Closets = 974.4 gpd

Greywater treatment system holds water for an average of 10 days.

Total Greywater Production from Showers = 20750 gal./10 days
Total Greywater Consumption from Water Closets = 9744 gal./10 days

x 0.1337 = 2774.3 CF

x 1.25 = 3467.8 CF

÷ 2 = 1733.9 CF

÷ 3' = 577.97 SF



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 CONSTRUCTION MANAGEMENT

Greywater Material Costs

- * Cost calculations only include materials
- * Assume a cost multiplier of 0.45 on list prices at 10ft. Lengths.

By adding the Greywater system to the building, a sanitary riser must be added and the Water Closet Riser must be redirected from the city water supply to the greywater supply system.

11 Sanitary Risers must be added to separate the Shower water and direct it to the greywater system.

Sanitary Riser Length =	46 LF for 4" pipe	
Total Sanitary Riser Length =	506 LF for 4" pipe	24LF/man-day
Total Sanitary Riser Cost =	\$3,363.13	
Redirected Horizontal Piping =	130.00 LF for 4" pipe	18LF/man-day
Horizontal Piping Cost =	\$864.05	
Constructed Wetlands Piping =	90.00 LF for 2" pipe	18LF/man-day
Wetlands Piping Cost =	\$333.72	
Duplex Booster Pump Cost =	\$15,817.00	
6,800 Gallon Open Top Tank =	\$3,400.00	8 Tanks needed
500 Gallon Storage Tank =	\$700.00	
Total Open Top Tank Cost =	\$27,900.00	
6,800 Gallon Basin =	\$5,500.00	2 Basins needed, customized for filters and fountain.
Total Basin Cost =	\$16,500.00	
Pumps and Fountain Head Cost =	\$470.00	
3" to 5" VA 1,2,3,4 Stone =	\$25.00 per TON	79 Tons needed
Pea Gravel, Stone #78 =	\$30.00 per TON	35.84 Tons needed
Total Rock Bed Cost =	\$3,050.20	

Total Greywater System Cost = \$68,298.09

Add 30% for Shipping and Customization of Tanks

Total Greywater System Cost = \$88,787.52

Added Piping Installation Duration = 33 Man-Days *Crew Size Dependent - 2 crews of 3 men
 Added Piping Installation Duration = 6 Schedule Days

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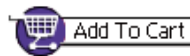
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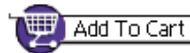
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Approx. Tablet Density	125 lbs./ft ³
Active Ingredient	Calcium Hypochlorite Ca (OCl) ₂ • H ₂ O
Available Chlorine	70%
Inert Ingredients	30%
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Magnetic Drive Pumps



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Stainless Steel & Bronze Pumps

Cal Pumps longtime customers rely on our stainless steel and bronze pumps, and once you've owned one, you'll know why. Five different models with flow rates from 225 gph to 2700 gph cover a wide variety of uses. All pumps in this series come with a two-year warranty and will provide trouble free use in freshwater, saltwater or chlorinated water (3-5ppm). You can even use it in hot water up to 110°F!

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S58020	Cal Pump S580T20	129.95	Buy Now 🛒
S90020	Cal Pump S900T20	139.95	Buy Now 🛒
S120020	Cal Pump S1200T20	149.95	Buy Now 🛒
SPB1	Cal Positioning Bracket for S580 S900 S1200	7.95	Buy Now 🛒

<<Top of Page>>

SKU	Description	Price	Order
CFS170	Cal Plastic Screen fits 1" FNPT	7.95	Buy Now 🛒
CFS155	Cal Plastic Screen fits 1/2" and 3/4" FNPT	7.95	Buy Now 🛒
955	Cal Foam Pre-filter for CFS155	13.95	Buy Now 🛒

Aluminum Pumps

Cal Pumps durable cast aluminum pumps

have been a best seller at Cal Pump for over 40 years. They are reliable, versatile and can be used submerged or in open air. You can select from three different models ranging from 210 gph to 430 gph and, although the pumps come standard with a 6' or 20' power cord, custom cord lengths are available up to 100'. The motor is permanently sealed in a biodegradable vegetable-based lubricant for long lasting and safe operation.



SKU	Description	Price	Order
A21020	Cal Pump A210 gph	68.95	Buy Now
A28020	Cal Pump A280 gph	69.95	Buy Now
A43020	Cal Pump A420 gph	71.95	Buy Now

<<Top of Page>>

Epoxy encapsulated Pond Pumps

Cal Pumps designed three epoxy pumps with flow rates from 200 gph to 500 gph. You'll find they're perfect for your fountain, pond or nearly any de-watering application. The tough plastic pump and trouble free motor are designed to peacefully co-exist with any water feature. These pumps come with a 6' or 20' power cord standard, or custom cord lengths are available up to 100'. All models of epoxy pumps are standard with .316 stainless steel shaft. Suitable for use in fresh, salt or chlorinated water (3-5 ppm).



SKU	Description	Price	Order
E-200-20	Cal Pump E-200-20		
E-350-20	Cal Pump E-350-20		

Cal Fountain Heads



FT2 3 step Flower



FT4 Water Lily



FT5 Aqua Dome



FT9 Trumpet



FT10 Pattern Set of 4



FT25 1/2" Telescoping Riser



FT30 3/4" Telescoping Riser w/ diverter

for P80/P140 FT724 17" Ring w/22 jets w/diverter

SKU	Description	Price	Order
FT2	Cal FT2 Plastic 3 step Fleur de Lis fountain head	8.95	Buy Now
FT4	Cal FT4 Plastic Water lily fountain head	8.95	Buy Now
FT5	Cal FT5 Plastic Aqua dome fountain head	8.95	Buy Now
FT9	Cal FT9 Plastic Trumpet fountain head	.95	Buy Now
FT10	Cal 4 Pattern Fountain head set for P80/140	13.95	Buy Now
FT724	Cal 17" ring with 22 jets	89.95	Buy Now
FT25	1/2" telescoping riser w/diverter	8.95	Buy Now
FT30	3/4" telescoping riser w/diverter	14.95	Buy Now

<<Top of Page>>

Large Volume submersible Pumps

The sound of a waterfall cascading down rocks into a pond or stream enhances the auditory experience in a way no other water feature can. A waterfall further benefits fish and plant life by oxygenating the water as it returns to its basin.

waterfall pumps are solidly constructed with non-corrosive components, ceramic mechanical seal and brass insert in the 1 1/4" discharge. Their water-cooled design ensures safe and efficient operation without fear of harm to ornamental fish or aquatic plants.



SKU	Description	Price	Order
PW1200	Cal Pump PW1200	100.95	Buy Now
PW2500	Cal Pump PW2500	121.95	Buy Now
PW3500	Cal Pump PW3500	136.95	Buy Now
PW4500	Cal Pump PW4500	162.95	Buy Now
PW5500	Cal Pump PW5500	185.95	Buy Now

<<Top of Page>>

Torpedo Pump

The first pump designed for the pond enthusiast that is lightweight, water cooled, uses no oil and can be used in or out of water. Its high volume water flow and low energy consumption makes it the most unique pond pump available, and it requires no tools for installation.



SKU	Description	Price	Order
T1500	Cal Pump T1500	128.95	Buy Now
T4000	Cal Pump T4000	165.95	Buy Now
T7500	Cal Pump T7500	250.95	Buy Now
T10000	Cal Pump T10000	285.95	Buy Now

PL0150	Plastic Suction Strainer 1.5"	9.95	Buy Now
PL0200	Plastic Suction Strainer 2"	10.95	Buy Now
PL0300	Plastic Suction Strainer 3"	14.95	Buy Now
TF10	Torpedo Screen 1 1/2" thread	10.95	Buy Now

Water Garden Pumps with Venturi

- Thermal protection switch to protect pump from accidental burn out due to clogs or jams
- Complete with a telescoping riser/diverter and two beautiful spray heads
- 3 year limited warranty
- 20 foot cord



SKU	Description	Price	Order
WG660	Water Garden pump w/venturi 660 gph	67.95	Buy Now
WG1000	Water Garden pump w/venturi 1000 gph		Sold Out
WG1500	Water Garden pump w/venturi 1500 gph		Sold Out



Striking lighting effects can be added to the display of motion by combining EggLites with SplashDance controlled fountains.

Simple solutions. Beautiful results.

Kits do not include EggLites

SKU	Description	Price	Order
SDS201	Cal Splash Dance Small Single Pump Kit	142.95	Buy Now
SDM203	Cal Splash Dance Small 3 pump kit	272.95	Buy Now
SDS1001	Cal Splash Dance Large Single Pump Kit	215.95	Buy Now
SDM1003	Cal Splash Dance Larsh 3 pump kit	349.95	Buy Now
SDIG	Cal Splash Dance Option in-ground Installation Kit	53.95	Buy Now
LES3	Cal 3 egg-lite Kit w/30' cord	64.95	Buy Now
SDRJ	Cal Garden Decor Kit for Splashdance	97.95	Buy Now

[View Cart/Check Out](#) Phone: 1-410-803-1688



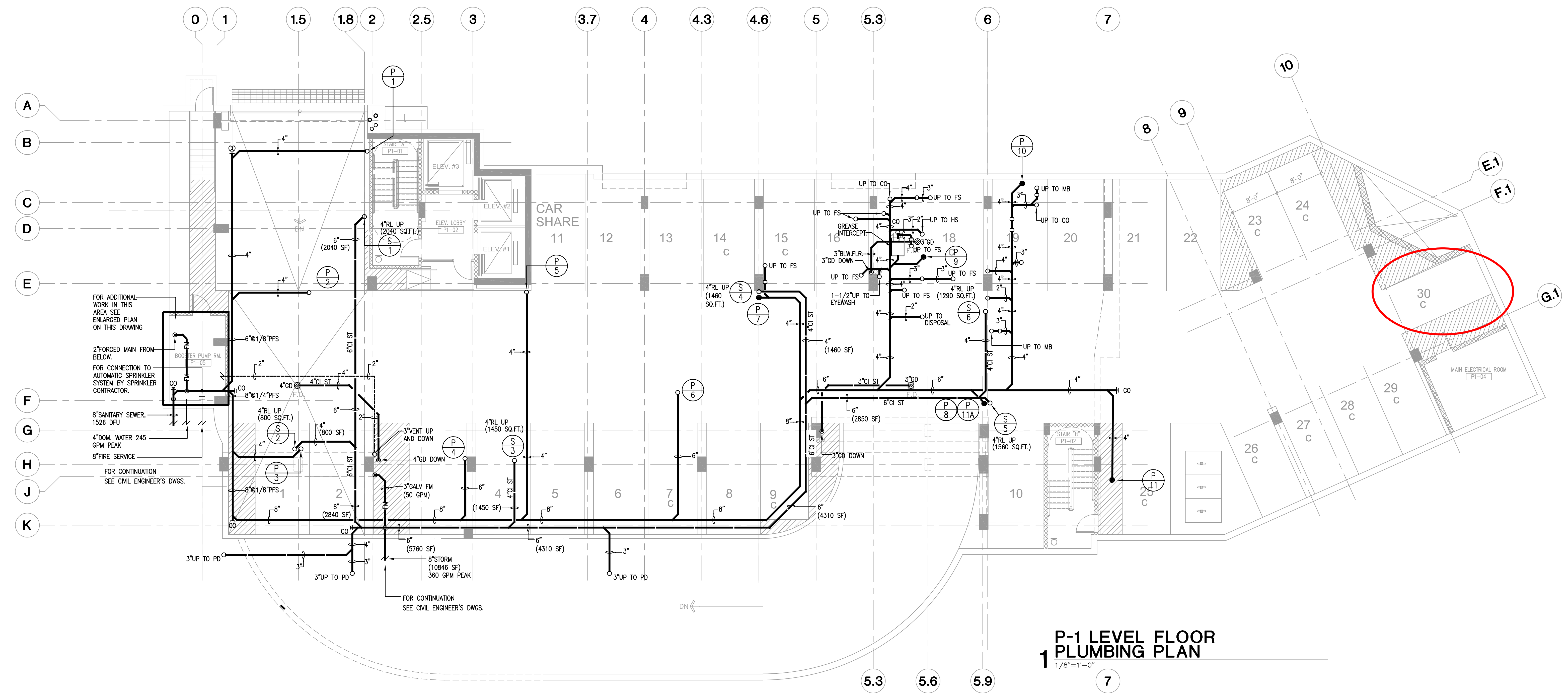
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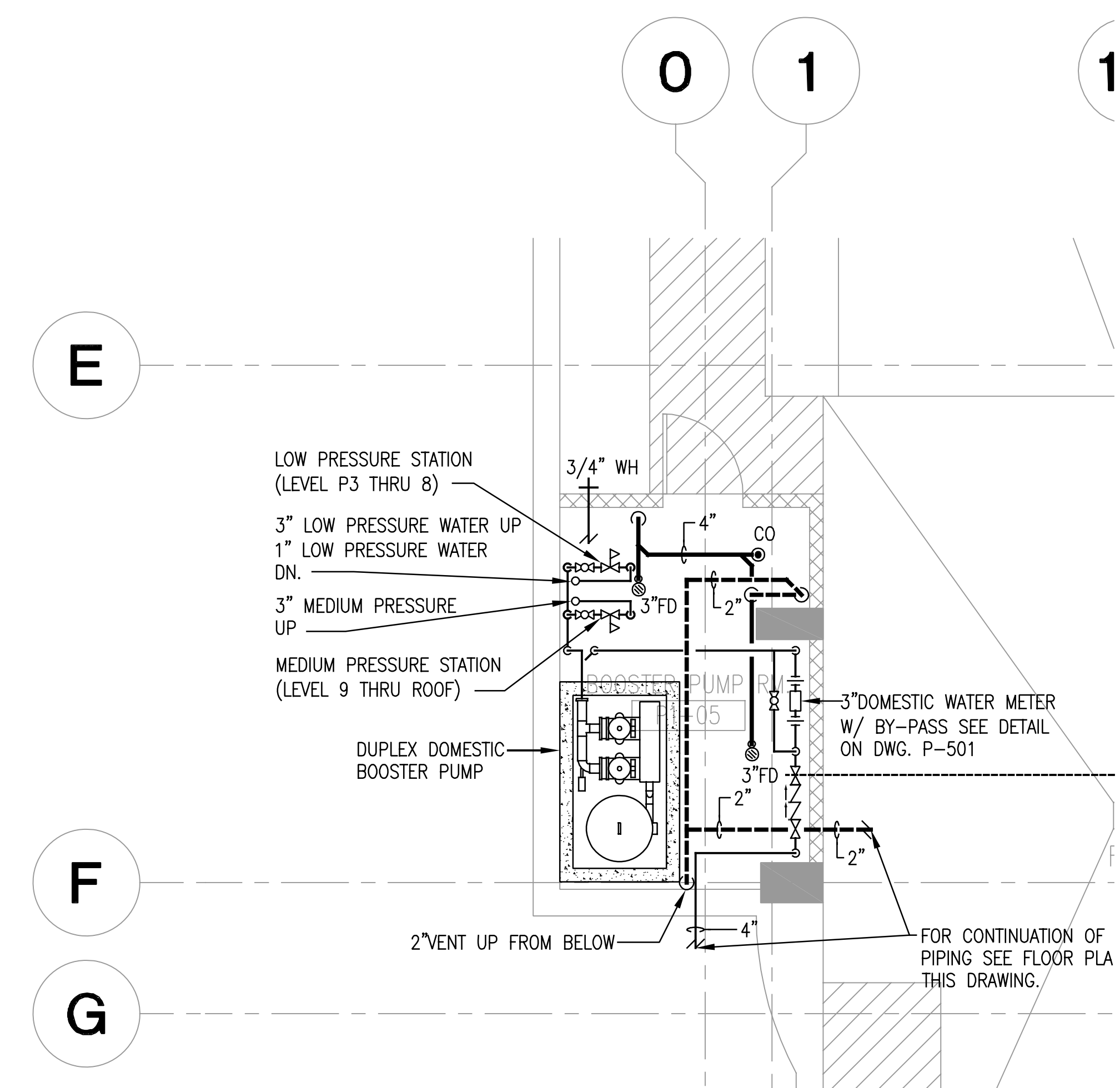
Southland Industries
2240 WHELAN STREET, SUITE 177
DALLAS, VIRGINIA 22119
(703) 834-5570

REVISIONS

PERMIT SET	OCT. 20, 2006
95% PRICING	DEC. 01, 2006
CITY OF ALEXANDRIA PERMIT COMMENTS	DEC. 12, 2006
CITY OF ALEXANDRIA PERMIT COMMENTS #2	JAN. 23, 2007
FINAL CONSTRUCTION SET	FEB. 16, 2007



P-1 LEVEL FLOOR PLUMBING PLAN 1
1/8"=1'-0"



PARTIAL P-1 LEVEL FLOOR PLUMBING PLAN 2
1/4"=1'-0"

SEE WMATA NOTE ON SHEET A-001.

PROJECT TITLE
RESIDENCE INN BY MARRIOTT

2345/2347 MILL ROAD
ALEXANDRIA, VIRGINIA
PROJECT NO. 305412.00

DRAWING TITLE
P-1 LEVEL FLOOR PLAN PLUMBING

Printed On: 2/16/07, 11:00 am
SCALE 1/8"=1'-0"
DATE OCTOBER 20th, 2006
DRAWN BY
CHECKED BY

P-103.dwg
DRAWING NUMBER
P-103
SHEET 0 OF 00

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VIRGINIA-AMERICAN WATER COMPANY

RATES, RULES AND REGULATIONS

FOR

FURNISHING WATER SERVICE IN THE TERRITORY SUPPLIED BY THE COMPANY IN THE CITY OF ALEXANDRIA, CITY OF HOPEWELL, A PORTION OF PRINCE GEORGE COUNTY AND A PORTION OF PRINCE WILLIAM COUNTY, VIRGINIA.

FILED: June 14, 2001

EFFECTIVE:

March 6, 2000

**VIRGINIA-AMERICAN WATER COMPANY
ALEXANDRIA - HOPEWELL - PRINCE WILLIAM DISTRICTS**

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FILED: June 14, 2001

EFFECTIVE:

March 6, 2000

VIRGINIA-AMERICAN WATER COMPANY

Alexandria District

**Water - S.C.C. Va. No. 12
Sixth Revised Page No. 1**

Applicable in all territory served by the Alexandria District.

AVAILABILITY OF SERVICE:

Available to all metered customers other than public authority customers and customers purchasing water for resale.

RATE:

	Gallons Per		Rate Per
	<u>Month</u>	<u>Quarter</u>	<u>1,000 Gallons</u>
For the first	2,000	6,000	(minimum charge)
For all over	2,000	6,000	\$1.3757

MINIMUM CHARGE:

No bill will be rendered for less than the minimum charges set forth below:

<u>Size of meter</u>	Minimum Charge	
	<u>Per Month</u>	<u>Per Quarter</u>
5/8 inch	\$8.28	\$24.84
3/4 inch	12.44	37.32
1 inch	20.71	62.13
1 1/2 inch	41.42	124.26
2 inch	66.26	198.78
3 inch	124.28	372.84
4 inch	207.14	621.42
6 inch	414.29	1,242.87
8 inch	662.85	1,988.55

ACTIVATION CHARGE:

When a customer applies to initiate water service, a charge of twenty-five dollars (\$25.00) will be assessed to cover the cost of activating the service.

SERVICE CONNECTION CHARGE:

3/4 inch Service Connection	\$900.00
Service Connections over 3/4 inch	Actual cost to Company including overhead

All service connection charges will be gross-up for federal income tax if any should occur. The customer shall pay to the Company the service connection charge prior to installation.

Turn-on and shut-off charges during normal scheduled working hours associated with new accounts, seasonal customers, as well as non-payment and rules violation situations, will be \$25.00. An additional charge of \$25.00 will be made for all returned checks tendered.

METER RATES (Continued)

A multiple unit housing development owned by an individual, partnership or corporation other than a governmental authority where each and every unit in the development has at all times the same common owner, is located on a single site composed of one or more contiguous parcels; where the housing development owns, maintains and operates all lines of pipe for the distribution of water within the site; and where the housing development furnishes water to its tenants as part of the considerations for the rent charged and does not install, maintain or operate water meters for the submetering of water service; where the housing development enters into a special contract with the Company, with such guarantee as may be satisfactory to the Company, to pay to the Company, a minimum of \$5,000 per month for water service to said premises; at the regularly established rates of the Company.

Meters, except those installed on private fire connections or sewer exempt meters will be furnished, installed and removed by the Company and shall remain its property.

When meters are installed for the purpose of allowing customers to use water and be exempt from sewer charges, the customer shall provide a meter and installation at his expense; however, the meter location and type must be approved by the Water Company.

Turn-on and shut-off charges during normal scheduled working hours will be \$ 25.00.

An additional charge of \$ 25.00 will be made for all returned checks tendered.

VIRGINIA-AMERICAN WATER COMPANY
Hopewell District

Water - S.C.C. Va. No. 12
Sixth Revised Page No. 3
Canceling Fifth Page No. 3

Applicable in all territory served by the Hopewell District.

AVAILABILITY OF SERVICE:

Available to all metered customers for water treated with fluoride and carbon as required, except for public authority customers and customers purchasing water for resale.

METER QUANTITY CHARGE:

Where water is supplied by meter measurement, each customer shall be required to pay, and the Company shall collect for all water so supplied at the regular published schedule of rates, herein set forth, subject to the meter minimum charges herein stated.

RATE:

	Cubic Feet		Rate Per
	<u>Month</u>	<u>Quarter</u>	<u>100 Cubic Feet</u>
For the first	300	900	(minimum charge)
For the next	1,700	5,100	\$3.2320
For the next	298,000	894,000	2.7092
For the next	700,000	2,100,000	1.7782
For the next	5,000,000	15,000,000	.7432
For All Over	6,000,000	18,000,000	1.0068

MINIMUM CHARGE:

No bill will be rendered for less than the minimum charges set forth below:

<u>Size of meter</u>	Minimum Charge	
	<u>Per Month</u>	<u>Per Quarter</u>
5/8 inch	\$12.20	\$36.60
3/4 inch	18.30	54.90
1 inch	30.40	91.20
1 1/2 inch	60.90	182.70
2 inch	97.50	292.50
3 inch	182.50	547.50
4 inch	304.00	912.00
6 inch	609.00	1,827.00
8 inch	974.00	2,922.00
10 inch	1,319.00	3,957.00
12 inch	2,622.00	7,866.00

ACTIVATION CHARGE:

When a customer applies to initiate water service, a charge of twenty-five dollars (\$25.00) will be assessed to cover the cost of activating the service.

SERVICE CONNECTION CHARGE:

3/4 inch Service Connection	\$560.00
Service Connections over 3/4 inch	Actual cost to Company including overhead

All service connection charges will be gross-up for federal income tax if any should occur. The customer shall pay to the Company the service connection charge prior to installation.

Turn-on and shut-off charges during normal scheduled working hours associated with new accounts, seasonal customers, as well as non-payment and rules violation situations, will be \$25.00. An additional charge of \$25.00 will be made for all returned checks tendered.

FILED: October 1, 2004

EFFECTIVE: November 1, 2004

(Rates originally went into effect on 3/15/04 subject to refund)

VIRGINIA-AMERICAN WATER COMPANY

Applicable in all territory served by the Hopewell District.

AVAILABILILTY OF SERVICE:

Available to all metered customers that purchase non-potable service and have potable and non-potable annual consumption averages greater than or equal to 3 million gallons per day, except public authority non-potable customers.

METER QUANTITY CHARGE:

Where water is supplied by meter measurement, each customer shall be required to pay, and the Company shall collect for all water so supplied at the regular published schedule of rates, herein set forth, subject to the meter minimum charges herein stated.

RATE:

	<u>Month</u>	<u>Quarter</u>	<u>Rate Per 100 Cubic Feet</u>
For the first	10,000 ccf	30,000 ccf	\$1.0068
For the next	290,000 ccf	870,000 ccf	.6747
All over	300,000 ccf	900,000 ccf	.7432

MINIMUM CHARGE:

No bill will be rendered for less than the minimum charges set forth below:

<u>Size of meter</u>	<u>Minimum Charge</u>	
	<u>Per Month</u>	<u>Per Quarter</u>
5/8 inch	\$12.20	\$36.60
3/4 inch	18.30	54.90
1 inch	30.40	91.20
1 1/2 inch	60.90	182.70
2 inch	97.50	292.50
3 inch	182.50	547.50
4 inch	304.00	912.00
6 inch	609.00	1,827.00
8 inch	974.00	2,922.00
10 inch	1,319.00	3,957.00
12 inch	2,622.00	7,866.00

FILED: October 1, 2004

EFFECTIVE: November 1, 2004
(Rates originally went into effect on 3/15/04 subject to refund)

Applicable in all territory served by the Hopewell District.

AVAILABILITY OF SERVICE:

Available to all metered customers that purchase non-potable service and have potable and non-potable annual consumption averages less than 3 million gallons per day, except public authority non-potable customers.

METER QUANTITY CHARGE:

Where water is supplied by meter measurement, each customer shall be required to pay, and the Company shall collect for all water so supplied at the regular published schedule of rates, herein set forth, subject to the meter minimum charges herein stated.

RATE:

	<u>Month</u>	<u>Quarter</u>	<u>Rate Per 100 Cubic Feet</u>
First	10,000 ccf	30,000 ccf	\$1.4180
Next	20,000 ccf	60,000 ccf	1.2145
All over	30,000 ccf	90,000 ccf	.6747

MINIMUM CHARGE:

No bill will be rendered for less than the minimum charges set forth below:

<u>Size of meter</u>	<u>Minimum Charge</u>	
	<u>Per Month</u>	<u>Per Quarter</u>
5/8 inch	\$12.20	\$36.60
3/4 inch	18.30	54.90
1 inch	30.40	91.20
1 1/2 inch	60.90	182.70
2 inch	97.50	292.50
3 inch	182.50	547.50
4 inch	304.00	912.00
6 inch	609.00	1,827.00
8 inch	974.00	2,922.00
10 inch	1,319.00	3,957.00
12 inch	2,622.00	7,866.00

FILED: October 1, 2004

EFFECTIVE: November 1, 2004
(Rates originally went into effect on 3/15/04 subject to refund)

VIRGINIA-AMERICAN WATER COMPANY

Prince William District

Water - S.C.C. Va. No. 12
Second Revision Page No.5

Applicable in all territory served by the Prince William District.

AVAILABILITY OF SERVICE:

Available to all metered customers other than public authority customers and customers purchasing water for resale.

RATE:

	Gallons Per		Rate Per
	<u>Month</u>	<u>Quarter</u>	<u>1,000 Gallons</u>
For the first	2,000	6,000	(minimum charge)
For all over	2,000	6,000	\$3.2332

MINIMUM CHARGE:

No bill will be rendered for less than the minimum charges set forth below:

<u>Size of meter</u>	Minimum Charge	
	<u>Per Month</u>	<u>Per Quarter</u>
5/8 inch	\$7.58	\$22.74
3/4 inch	11.37	34.11
1 inch	18.95	56.85
1 1/2 inch	37.89	113.67
2 inch	60.63	181.89
3 inch	113.67	341.01
4 inch	189.46	568.38
6 inch	378.91	1,136.73
8 inch	606.26	1,818.78

ACTIVATION CHARGE:

When a customer applies to initiate water service, a charge of twenty-five dollars (\$25.00) will be assessed to cover the cost of activating the service.

SERVICE CONNECTION CHARGE:

3/4 inch Service Connection	\$675.00
Service Connections over 3/4 inch	Actual cost to Company including overhead

All service connection charges will be gross-up for federal income tax if any should occur. The customer shall pay to the Company the service connection charge prior to installation.

Turn-on and shut-off charges during normal scheduled working hours associated with new accounts, seasonal customers, as well as non-payment and rules violation situations, will be \$25.00. An additional charge of \$25.00 will be made for all returned checks tendered.

FILED: September 30, 2005

EFFECTIVE: November 1, 2004

VIRGINIA-AMERICAN WATER COMPANY

Alexandria District
Prince William District

Water - S.C.C. Va. No. 12
First Revision Page No. 6
Canceling Original Page No. 6

RIDER A

Purchased Water Surcharge

The rates charged for water in the Alexandria and Prince William Districts are subject to fluctuation in accordance with the following formula:

1. On December 1 of each year (and during the month in which this adjustment becomes effective), the Company shall compute a Purchased Water Surcharge in the following manner:

P1 = The Cost of water to be paid by the Company to Fairfax County Water Authority on estimated purchases during the succeeding year, taking into account all proposed charges.

P2 = The number of gallons used in the computation made pursuant to P1 above priced at 43.2¢ per 1,000 gallons in the case of the Alexandria District and 32¢ per 1,000 gallons in the case of the Prince William District.

S = Estimated sales in 1,000 gallons during such succeeding year (or remainder of the first year.)

T = The sum of the state and local gross receipts tax rates (expressed as a percentage) to be effective during the next succeeding year (or remainder of the first year).

The surcharge per 1,000 gallons is computed as follows:

$$\frac{(P1 - P2)}{(S)} * \frac{(1)}{(1 - T)} = \text{Purchases Water Surcharge}$$

The surcharge shall be computed separately for the Alexandria and Prince William Districts.

FILED: September 30, 2005

EFFECTIVE: March 6, 2000

VIRGINIA-AMERICAN WATER COMPANY

**Alexandria District
Prince William District**

**Water - S.C.C. Va. No. 12
Original Page No. 7**

The computation shall be submitted to the Commission and, unless disapproved because of incorrect calculations, shall be applied to all bills rendered after January 1 of the succeeding year.

2. On or before June 1 of each year beginning in 1990, the Company shall submit to the Commission a Purchased Water Adjustment Factor as follows:

A = The amount charged or credited to the Company by Fairfax County Water Authority because the actual amount of charges was greater or less than the estimated amount used in the computation of bills rendered during the preceding calendar year.

B = The amount over or under collected in the previous years Purchased Water Adjustment Factor, excluding gross receipts taxes (True-up Mechanism).

C = The estimated number of gallons expressed in 1,000 gallon terms to be sold by the Company from June 1 through December 31 of the current year.

T = The sum of the state and local gross receipt tax rates (expressed as a percentage) to be effective during the current year.

The additional surcharge or credit (Purchased Water Adjustment Factor) is computed as follows:

$$\frac{(A + B) * \frac{1}{C}}{(1 - T)} = \text{Purchased Water Adjustment Factor}$$

This computation shall be made separately for the Alexandria and Prince William Districts.

FILED: June 14, 2001

EFFECTIVE: March 6, 2000

VIRGINIA-AMERICAN WATER COMPANY

**Alexandria District
Prince William District**

**Water - S.C.C. Va. No. 12
Original Page No. 8**

This computation shall be submitted to the Commission and, unless it is disapproved because of incorrect calculations, the additional surcharge shall be charged or the special credit shall be credited on bills rendered for all water sales between June 1 and December 31.

FILED: June 14, 2001

EFFECTIVE: March 6, 2000

RIDER A
ALEXANDRIA DISTRICT
Computation of the Purchased Water Adjustment Rate
In Accordance with Rider A Original Sheet No. 18 S.C.C. VA. No. 11.

P1 = Total estimated dollars to be paid to Fairfax County Water Authority :

Basic monthly charge (\$ 25,253.13 x 12)	=	\$303,038
Supplemental monthly charge (\$ 5,698 x 1) + ((\$ 750 + \$ 9,554) x 12)	=	129,346
O & M Expense (6,108,332 (000 gal) x .82)	=	5,008,832
Extraordinary major repair, replacement or improvement (6,108,332 (000 gal) x .18) (New five year rate Established 01/01/07)	=	1,099,500
Improvement Fund Expenditures 2002 - 2006 (\$22,706 x 12)		272,472
FCWA Occoquan Plant Replacement monthly amount (\$ 135,349.14 x 1) + (141,047.14*11)	=	<u>1,686,868</u>
Total amount to be paid to F.C.W.A.	=	8,500,056

P2 = Total gallons sold x \$.432
5,561,636 (000 gal) x \$.432 2,402,627

S = Estimated sales - 1,000 gallons = 5,561,636

T = Effect of gross receipts taxes

$$\frac{(P1 + P2)}{S} \quad x \quad \frac{1}{(1 - T)}$$

$$\frac{\$ 8,500,056 - \$ 2,402,627}{5,561,636} \quad x \quad \frac{1}{1 - .0260}$$

$$\frac{6,097,429}{5,561,636} \quad x \quad \frac{1}{0.9740}$$

$$1.09634 \quad x \quad 1.02669 \quad = \quad 1.12560$$

Rate used
Surcharge effective 01/01/08 : \$ 1.126

Effective : January 1, 2008

RIDER A
PRINCE WILLIAM DISTRICT
Computation of the Purchased Water Adjustment Rate
In Accordance with Rider A Original Sheet No. 18 S.C.C. VA. No. 11.

P1	= Total estimated dollars to be paid to Fairfax County Water Authority :		
	Basic monthly charge (\$ 19,015.41 x 12)	=	\$228,185
	Supplemental monthly charge (\$ 1,258 x 1) + ((\$ 424 + \$ 2,397) x 12)	=	35,110
	O & M Expense (1,889,947 (000 gal) x .82)	=	1,549,757
	Supplemental monthly charge No. 2 Transmission Main (\$ 9,964 x 12)	=	119,568
	Supplemental monthly charge No. 3 Additional capacity (\$ 68,491 x 12)	=	821,892
	Extraordinary major repair, replacement or improvement (1,889,947 (000 gal) x .18) (New five year rate Established 01/01/07)	=	340,190
	Improvement Fund Expenditures 2002 - 2006 (\$13,078 x 12)		156,936
	FCWA Occoquan Plant Replacement monthly amount (\$ 23,185.88 x 1) + (\$ 24,443.88 x 11)	=	<u>292,069</u>
	Total amount to be paid to F.C.W.A.	=	3,543,707
P2	= Total gallons sold x \$.32		
	1,719,868 (000 gal) x \$.32		550,358
S	= Estimated sales - 1,000 gallons = 1,719,868		
T	= Effect of gross receipts taxes		
	<u>(P1 + P2)</u>	x	<u>1</u>
	S		(1 - T)
	<u>\$ 3,543,707 - \$ 550,358</u>	x	<u>1</u>
	1,719,868		1 - .0239
	<u>2,993,349</u>	x	<u>1</u>
	1,719,868		0.9761
	1.74045	x	1.02449 =
			1.78307
	Rate used		
	Surcharge effective 01/01/08 :	\$	1.783

Effective : January 1, 2008

RIDER B
ALEXANDRIA DISTRICT
Computation of the Sales & Use Tax Surcharge Rate
In Accordance with Va Code & 58.1-603 and 58.1-604

- A = Amount charged to Company by Vendors for sales tax to tangible personal property
- B = Amount (over) or under collected in the previous year's sales tax.
- C = Estimated sales from September 1 through August 31 (1,000 gallons).
- T = Sum of state and local gross receipts tax rates.

$$\frac{(A + B)}{C} \times \frac{1}{(1 - T)}$$

$$\frac{155,060}{6,132,944} \times \frac{1}{(1 - .0270)}$$

$$\frac{155,060}{6,132,944} \times 1.027749$$

$$\frac{159,363}{6,132,944} = 0.0260$$

Rate used	
Surcharge effective 09/01/04 :	0.026
September 1, 2004 Surcharge Rate	\$0.026
September 1, 2005 Adjustment	(0.052)
September 1, 2006 Adjustment	<u>0.026</u>
Net Surcharge	<u>(\$0.000)</u> per 1,000 gallons

Effective : September 1, 2006

RIDER B
PRINCE WILLIAM DISTRICT
Computation of the Sales & Use Tax Surcharge Rate
In Accordance with Va Code & 58.1-603 and 58.1-604

- A = Amount charged to Company by Vendors for sales tax to tangible personal property
- B = Amount (over) or under collected in the previous year's sales tax.
- C = Estimated sales from September 1 through August 31 (1,000 gallons).
- T = Sum of state and local gross receipts tax rates.

$$\frac{(A + B)}{C} \times \frac{1}{(1 - T)}$$

$$\frac{62,627}{2,169,669} \times \frac{1}{(1 - .0249)}$$

$$\frac{62,627}{2,169,669} \times 1.025536$$

$$\frac{64,226}{2,169,669} = 0.0296$$

Rate used		
Surcharge effective 09/01/04 :		0.030
September 1, 2004 Surcharge Rate		\$0.030
September 1, 2005 Adjustment		(0.060)
September 1, 2006 Adjustment		<u>0.030</u>
Net Surcharge		<u>(\$0.000)</u> per 1,000 gallons

Effective : September 1, 2006

RIDER B
HOPEWELL DISTRICT
Computation of the Sales & Use Tax Surcharge Rate
In Accordance with Va Code & 58.1-603 and 58.1-604

- A = Amount charged to Company by Vendors for sales tax to tangible personal property
- B = Amount (over) or under collected in the previous year's sales tax.
- C = Estimated sales from September 1 through August 31 (CCF).
- T = Sum of state and local gross receipts tax rates.

$$\frac{(A + B)}{C} \times \frac{1}{(1 - T)}$$

$$\frac{69,735}{9,950,231} \times \frac{1}{(1 - .0270)}$$

$$\frac{69,735}{9,950,231} \times 1.027749$$

$$\frac{71,670}{9,950,231} = 0.00720$$

Rate used	
Surcharge effective 09/01/04 :	0.00720
September 1, 2004 Surcharge Rate	\$0.0072
September 1, 2005 Adjustment	(0.0144)
September 1, 2006 Adjustment	<u>0.0072</u>
Net Surcharge	<u>(\$0.0000)</u>

Effective : September 1, 2006

RULES AND REGULATIONS

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RULES AND REGULATIONS

The Rules and Regulations, as herein set forth, or as they may hereafter be altered or amended in a regular or legal manner, shall govern the rendering of water service, including the extension of mains and the making of connections thereto, and every customer, upon signing an application for any service rendered by the Company, or upon the taking of water service, shall be bound thereby.

RULE NO. 1 - DEFINITIONS:

(a) A “service connection” is a pipe used to supply a single premise only, and no premises shall be supplied by more than one service connection unless agreed upon between the owners and the Company.

(b) “Premises” as used herein shall mean:

1. A building under one roof, owned or leased by one party and occupied as one business or residence; or
2. A combination of buildings, owned or leased by one party in one common enclosure, occupied by one family or business, exclusive of apartment houses; or
3. The one side of a double house, having a solid vertical partition wall; or
4. A building owned or leased by one party, of more than one apartment, and using in common one hall and one entrance; or
5. A building owned or leased by one party, having a number of apartments or offices, and using in common one hall and one or more means of entrance; or
6. A building owned or leased by one party having a number of apartments, offices or lofts which are rented to tenants; or
7. A combination of contiguous apartment buildings owned or leased by one party having a number of apartments which are rented to tenants; or
8. Each local housing authority created pursuant to State law operating without profit a low rent housing and slum clearance project which is located on a single site, provided that such site may be composed of one or more contiguous parcels and provided further that roadways through the site shall not be considered as dividing or separating the same into more than one site. Each such project will be billed for the consumption of the project as totalized whether or not one or more meters are used; or

RULES AND REGULATIONS

RULE NO. 1 - DEFINITIONS: (CONTINUED)

- (b) 9. A public building such as a town hall, school house, fire engine house, etc.; or
 - 10. A single lot or park or playground; or
 - 11. Each house or building in a row having common walls.
- (c) A “customer” is any party contracting for and receiving water service through a meter connection.
- (d) “Company” as used herein is Virginia-American Water Company.

RULE NO. 2 - SERVICE CONNECTIONS:

- (a) Before a service connection is provided, the owner of the premises to be supplied, or his duly authorized representative, shall make application for water service upon forms prescribed by the Company, and pay to the Company the service connection charges as herein provided on the appropriate District Tariff sheet. Upon approval of the application, the Company shall install the service connection from the main in the street to the outlet side of the curb stop when the meter is installed inside the property line of the premises or to the meter box when the meter is installed at the curb or property line.
- (b) The Company will maintain and replace when necessary all service connections from the main to the curb box or outside meter setting.
- (c) The Company will make all connections to its mains and will specify the size, kind and quality of all materials entering into the service connection.
- (d) The corporation cock, curb cock, curb box and service pipe from the street main to the curb box laid at right angles to the main will be furnished and installed by and shall remain the property of the Company and under its sole control and jurisdiction.
- (e) The service connection from the main to and including the curb box, or outside meter setting will be maintained by the Company at its expense.
- (f) These rules and regulations shall not apply to special connections for fire service, or to service of a temporary nature. Such special connections for fire service and services of a temporary nature shall be installed, maintained, replaced and removed at the expense of the owner, but such installation shall be subject to approval by the Company.

RULE NO. 3 - CUSTOMER'S SERVICE PIPES:

- (a) The Company will specify the size, kind and quality of the materials which shall be laid between the property line and the structures on the premises to be supplied.
- (b) The service pipe from the property line to the place of consumption, not less than 3/4 inch diameter, shall be furnished and installed by the customer at his expense and risk.

RULE NO. 3 - CUSTOMER'S SERVICE PIPES: (CONTINUED)

- (c) The customer's service pipe and all connections and fixtures attached thereto shall be subject to the inspection and approval of the Company before the water will be turned on.
- (d) The customer's service pipe shall be laid at all points at least three feet (3') below the surface of the ground and shall be installed in a trench at least ten feet (10') in a horizontal direction from any sewer trench and two feet (2') from any other trench unless otherwise specifically authorized or approved by the Company. In backfilling the trench, rock or ashes shall not be permitted within one foot (1') of the service pipe and clean soil shall be filled into a depth of at least one foot (1') over the service pipe. All installation shall conform to Commonwealth of Virginia Waterworks Regulations.
- (e) The customer shall install a stop and waste cock of a type approved by the Company on the service pipe immediately inside the foundation wall of the building supplied, or immediately outside of the foundation in a suitable tile or vault, and so located as to be easily accessible to the occupants and to provide proper drainage for all of the pipe line in the building and the meter if installed in the building.
- (f) No fixture shall be attached to or any branch made in the service pipe between the meter and the street main.
- (g) Any repairs, maintenance, replacement or relocation necessary on the customer's service pipe or fixtures in or upon the customer's premises shall be performed by the customer at his expense and risk.

RULE NO. 4 - CROSS CONNECTIONS AND BACK SIPHONAGE:

- (a) No pipe or fixtures connected with the mains of the Company shall also be connected with pipes or fixtures supplied with water from any other source.
- (b) Piping systems supplying swimming pools or tanks shall be so arranged as to prevent water from re-entering the water distribution system by siphonage or other means. An independent supply pipe shall be provided in such a way that its discharge end is at least eight inches (8") above the highest possible water level in such a swimming pool or tank. These installations shall, in each case, be approved by the Company.
- (c) The plumbing on all premises supplied from the Company's water system shall conform to the Commonwealth of Virginia Waterworks Regulations, and any local codes which may be applicable.

RULE NO. 5 - METERS AND METER INSTALLATIONS:

- (a) The Company shall determine the type and size of meter to be installed.
- (b) Meters, except those installed on private fire connections or for sewer exemption purposes, will be furnished, installed and removed by the Company and shall remain its property.
- (c) Where meters are installed within the building, the customer shall provide at his expense, a readily accessible and protected location for the installation of the meter at such a point as will control the entire supply to the premises, which location must be acceptable to the Company as most convenient for its service.
- (d) Each premises shall be supplied through a separate meter, or, if necessary and at the option of the Company, through a separate battery of meters. Where a battery of meters is installed, the registrations of such meters shall be combined for billing purposes and shall be subject to a Minimum Charge equal to the combined Minimum Charges for the meters comprising the battery setting. Where, however, a premises is supplied through more than one service, unless otherwise provided in contracts entered into for service to premises, the registration of the meter installed on each such service shall be billed separately subject to the Minimum Charge for each meter.
- (e) Meters will be maintained by the Company at its expense insofar as ordinary wear is concerned, but damage to any meter due to hot water, freezing, or other external causes arising out of or caused by the customer's negligence or carelessness shall be paid for by the customer.
- (f) The customer shall promptly notify the Company of any defect in or damage to the meter or its connection.

RULE NO. 6 - METER TESTS AND TEST FEES:

- (a) All meters are accurately tested before installation. Meters are also periodically tested in accordance with State Corporation Commission's Regulations. The Company may, at any time, remove any meter for routine tests, repairs, or replacement.

RULE NO. 6 - METER TESTS AND TEST FEES: (CONTINUED)

- (b) The Company shall, upon request of a customer, and if he so desires in his presence or that of his authorized representative, make without charge, a test of the accuracy of the meter in use at his premises, provided that the meter has not been tested by the Company or by the State Corporation Commission within the period of one year previous to such request, and that the customer will agree to abide by the results of such test in the adjustment of disputed charges. A written report of the results of the test shall be furnished the customer.

- (c) Whenever a test of a meter reveals it to have an average error or more than two percent (2%), the Company shall bill or refund to the customer, as the case may be, such percentage of the amount of bills, covering the consumption indicated by the meter for the previous six (6) months, as the meter was found to be in error at the time of test.

RULE NO. 7 - PRIVATE FIRE SERVICE CONNECTIONS:

- (a) All applications for private fire service connections and private fire hydrants shall be made in writing on application forms provided by the Company.

- (b) The size of the private fire service connection shall be determined by the Company.

- (c) The entire private fire service system shall be subject to the inspection test and approval of the Company before the service is made effective. The Company shall have the right to enter the premises at any reasonable time for the purpose of making an inspection of the entire private fire service system. Any irregularities disclosed shall be cause for discontinuing service unless corrected by the customer within ten (10) days after written notice is given by the Company.

- (d) No water shall be taken or used through a private fire service connection for any purpose other than for extinguishing fires, except for the purpose of testing fire fighting equipment. Such test as mentioned above may be made only under special permit from the Company, and the Company may require that its representative be present at such test.

- (e) Hydrants and other fixtures connected with a private fire service connection may be sealed by the Company and such seals shall be broken only in case of fire or as specially permitted by the Company, and the customer must immediately notify the Company of the breaking of any such seal.

RULE NO. 7 - PRIVATE FIRE SERVICE CONNECTIONS: (CONTINUED)

- (f) The Company shall not, in any way or under any circumstances, be held liable or responsible to any party for any losses or damage resulting from fire or water or other agency which may occur due to the installation of presence of a private fire service connection, or any pipe or fixture connected therewith; or for any losses or damage resulting from any leakage or other flow of water from said private fire service connection or any of the pipes or fixtures connected therewith; or for any losses or damage resulting from any excess or deficiency in pressure or supply of water due to any cause whatsoever.
- (g) The Company requires an approved fire line meter or a detector check valve with by-pass, including meter installed in such by-pass, to be furnished and installed by the customer just inside the building wall or other convenient location on the customer's premises.
- (h) The entire cost and expense of installing and maintaining a private fire service connection or a private fire hydrant shall be paid for by the customer, and any work done by the Company in connection therewith shall be at the expense and risk of the customer. The customer shall deposit with the Company, in advance, a sum estimated by the Company to cover the cost and expense of any labor or materials it may furnish. The deposit shall be adjusted upon completion of the work to agree with the actual cost and expense to the Company. The Company shall, at the expense of the customer, make the tap in the main.

RULE NO. 8 - CUSTOMER DEPOSITS:

- (a) The Company may require of any customer a cash deposit or other suitable guarantee to secure the performance by the customer of the terms and conditions of the Company under which water service is supplied. The amount of the deposit shall be determined in the following manner.

An amount equal to the estimated bill for two months service.

- (b) The deposit will be refunded after final settlement of the customer's account and interest on the deposit will be paid as determined by the Commission annually from the date of the deposit receipt to the date the customer discontinues the use of water service.
- (c) Whenever the Company has determined that a customer's credit has been satisfactorily established for a one-year period, it shall apply the deposit to the customer's account with interest.
- (d) If the customer fails to maintain satisfactory credit with the Company, it may require a deposit from the customer which will be held until the customer has established satisfactory credit for a period of not less than one year.

RULE NO.9 - DISCONTINUANCE OF WATER SERVICE:

- (a) Service rendered may be discontinued by the Water Company after ten (10) days written or printed notice for any of the following reasons:
- (1) For willful or indifferent waste of water due to any cause.
 - (2) For failure to protect and maintain the service pipe or fixtures on the property of the customer in a condition satisfactory to the Company.
 - (3) For molesting or tampering by the customer, or others with the knowledge of the customer, with any meters, connection, service pipe, curb cock, seal or any other appearance of the Company controlling or regulating the customer's water supply.
 - (4) For failure to provide the Company's employees free and reasonable access to the premises supplied, or for obstructing the way of ingress to the meter or other appliances controlling or regulating the customer's water supply.
 - (5) For nonpayment of any account ten (10) days past due for water supplied, for any fee or charge accruing under these Rules and Regulations and the effective Schedule of Rates. In no case shall payment for current service be considered past due if received by the Company within twenty (20) days from the mailing date or date of hand delivery.
 - (6) For violation of any rule or regulation of the Company.
 - (7) Upon the request of public authorities for nonpayment of sewer bills in accordance with Section 5.1-321 of the Code of Virginia.
- (b) Service may be disconnected after five (5) day written or printed notice if an insufficient funds check was utilized to make payment and the account is at least ten (10) days past the original due date.
- (c) Discontinuing the supply of water to a premises for any reason shall not prevent the Company from pursuing any lawful remedy by action at law or otherwise for the collection of moneys due from the customer.
- (d) When water service to a customer has been terminated for any above stated reasons, it will be renewed only after the conditions, circumstances or practices which caused the water service to be discontinued are corrected to the satisfaction of the Company, upon payment of all charges due and payable by the customer in accordance with these Rules and Regulations and the effective Schedule of Rates.

RULE NO.10- TURN-ON OR OFF CHARGES:

- (a) When water service to any premises has been discontinued because of nonpayment of a bill or other violation of the rules and regulations, the charge stated in the schedule of rates will be required during normal scheduled working hours; and this charge, together with all other amounts which may be due to Company by the customer, must be paid before the water is restored.
- (b) If, at the time of such discontinuance of service for nonpayment of bill, the customer does not have a deposit with the Company, the Company may require a deposit as a guarantee of the payment of future bills, as set forth in Rule. No. 8, before the water will be turned on.
- (c) For turn-ons and turn-offs requested by the customer, the charge stated in the schedule of rates will be required during normal working hours.
- (d) Turn-ons, turnoffs requested by the customer for reasons other than nonpayment of a bill during nonscheduled working hours will be paid by the customer at a cost of \$80.

RULE NO.11- BAD CHECK CHARGE:

Whenever a check tendered by a customer in payment of his bill is returned by the bank on which it is drawn unpaid, for any reason, the additional charge stated in the schedule of rates shall be added to the customer's bill.

RULE NO. 12- BILLS FOR WATER SERVICE:

- (a) Customers are responsible for furnishing the Company with their correct address. Failure to receive bills will not be considered an excuse for nonpayment nor permit an extension of the date when the account will be considered delinquent.
- (b) If bills are to be sent to an address other than the premises served, the Company should be notified in writing by the customer of any change of address.
- (c) If requested in writing by the customer, the Company will send bills to and will receive payments from agents of tenants, However, this accommodation will in no way relieve the customer of the liability for all water charges, and the Company shall not be obligated to notify the customer of the nonpayment of water bills by such agents or tenants.
- (d) Payment shall be made at the office of the Company or at such places conveniently located as may be designated by the Company.

RULE NO.12- BILLS FOR WATER SERVICE:(CONTINUED)

- (e) The Company reserves the right to correct any bills rendered in error as to service supplied.
- (f) Each "Premises" as described in Rule No. 1 shall be billed separately for service.
- (g) If the meter should fail to register for any reason, or if the meter reader should be unable to read the meter at the time the meter is to be read, an estimated bill will be submitted.
- (h) Bills for metered water service shall be rendered monthly or quarterly in arrears depending upon the class and quantity of service rendered.
- (i) Water for building purposes will be furnished by meter measurements only, and all water for building purposes must pass through one and the same meter. A suitable deposit, the amount to be determined by the Company, may be required.

RULE NO. 13 - TERM OF PAYMENT:

- (a) Bills for water service shall be due and payable twenty (20) days from the mailing date or date of hand delivery.
- (b) If a bill is not paid within ten (10) days after a written or printed notice properly given by the Company to the customer of record, the account will be delinquent, service may be discontinued and the meter removed by the Company, and the deposit, if any may be applied against such bill and any other arrears due by the customer.

RULES NO. 14 - CUSTOMER'S LIABILITY FOR CHARGES:

A customer who has made applications for or received water service at a premises shall be held liable for all water service to such premises until such time as the customer properly notifies the Company to discontinue the service for his account.

RULE NO. 15 - ABATEMENTS AND REFUNDS:

There shall be no abatement of the minimum water rates, in whole or in part, by reason of the extended absence of the customer, unless the customer has requested that such service be discontinued. No abatement shall be made for leaks or for water wasted by improper or damaged service pipes or fixtures belonging to the customer; except in the following cases:

- (1) In the residential and commercial classifications, a one time, adjustment will be considered for an underground leak. This adjustment will be based upon fifty percent (50%) of the excess in billed amounts as calculated from the previous three (3) consecutive billing periods. Adjustments will not be considered for new construction, where the permanent resident has occupied the property for less than one (1) year.

RULE NO. 15 - ABATEMENTS AND REFUNDS:(CONTINUED)

- (2) In the residential classification, a one time per five (5) year period, adjustment will be considered for a leaking toilet fixture. This adjustment will be based upon fifty percent (50%) of the excess in billed amounts as calculated from the previous three (3) consecutive billing periods. Adjustments will not be considered for new construction, where the permanent resident has occupied the property for less than one (1) year.

In each case where an adjustment is considered, satisfactory proof of repairs must be provided by the customer prior to processing of such adjustment

RULE NO.16- PRESSURE AND CONTINUITY OF SUPPLY:

- (a) The Company does not guarantee a sufficient or uniform pressure, or uninterrupted supply of water, and customers are cautioned to provide sufficient storage of water where an absolutely uninterrupted supply must be assured, such as for steam boilers, hot water systems, gas engines, etc.
- (b) In high level sections where pressure is low, the customer shall, if he desires a higher pressure than furnished at the mains of the Company, install at his own expense a tank and/or booster pump, of a type and installation approved by the Company.
- (c) Where the pressure to a customer's premises is greater than he wishes, it shall be his responsibility to install the proper regulating device to reduce the pressure to the extent desired.
- (d) The Company will supply at a minimum pressure of 20 psi., under normal operating conditions.

RULE NO.17- INTERCEPTING TANK REQUIRED FOR LARGE CUSTOMERS:

Service pipes for railroad locomotive supply or character of uses requiring a large quantity of water within a short period will not be permitted except through intercepting or intermediate storage tanks. The connection for such tanks shall be made in such a manner as may be approved by the Company.

RULE NO. -18 INTERRUPTIONS IN WATER SUPPLY:

- (a) The Company may, at any time, shut off the water in the mains in case of accident, or for the purpose of making connections, alterations, repairs changes or for public fire service or other emergencies whenever the public welfare may require it.
- (b) While it is the intention of the Company to give notice in advance of any work, which must be done, that will necessitate any interruption of the supply, such notice is to be considered a courtesy, and not a requirement on the part of the Company. Property owners must so regulate their installations connected with the water supply system that damage will not occur if water is shut off without notice.

RULE NO. -18 INTERRUPTIONS IN WATER SUPPLY:(CONTINUED)

- (c) The Company will undertake to use reasonable care and diligence in order to prevent and avoid interruptions and fluctuations in the service, but it cannot and does not guarantee that such will not occur

RULE NO.19 - GENERAL:

- (a) The service pipes, meter and fixtures on the customer's premises shall be accessible to the Company for observation or inspection at reasonable hours.
- (b) No one person shall turn the water on or off at any street valve, corporation cock, curb cock or other street connection or disconnect or remove any meter without the consent of the Company. Penalties provided by law for any such unauthorized action will be rigidly enforced.
- (c) Employees or agents of the Company are expressly forbidden to demand or accept any compensation for any service rendered to its customer except as covered by its Rules and Regulations and effective Schedule of Rates.
- (d) No employee or agent of the Company shall have the right or authority to bind it by any promise, agreement or representation contrary to the letter or intent of these Rules and Regulations.
- (e) Any complaint against the service or employees of the Company should be made at the office of the Company and preferably in writing.

RULE NO. 20 - PUBLIC FIRE HYDRANTS:

General - The following provisions shall apply to all fire hydrants:

- (a) The use of public fire hydrants will be restricted to the taking of water for the extinguishments of fire and water shall not be taken from any public fire hydrants for construction purposes, sprinkling streets, flushing sewer or gutter, or for any other use, unless specially permitted by the Company for the particular time and occasion.
- (b) The Company shall not be considered in any manner as insurer of persons or property, or to have undertaken to extinguish fires, or to protect any persons or property against loss or damage by fire or otherwise, and shall not be responsible to any person or persons for any loss, damage or injury by reason of fire, water, failure to supply water or pressure, or for any other cause whatsoever.
- (1) Alexandria District - The installation of fire hydrants in the Alexandria District shall be installed in accordance with existing franchise agreements.
- (2) Hopewell District - The installation of fire hydrants in the Hopewell District shall be installed in accordance with existing franchise agreements.

RULE NO. 20 - PUBLIC FIRE HYDRANTS: (CONTINUED)

- (3) The installation of public fire services in the Hopewell District, outside the City of Hopewell shall be installed as follows:

Any government unit located in the Utility's service area by ordinance of its Council or by resolution of its Board of County Commissioners shall have the right to order the installation of additional fire hydrants on existing utility owned mains having an internal diameter of six (6) inches or larger and the utility will install such hydrants at its own cost and expense; provided, however, the estimated gross receipts from hydrant rentals shall equal or exceed twenty-four (24) percent annually of the cost of said installations.

- (4) Prince William District- Public fire hydrants will be installed in public streets and roads at the expense of the developer of the property. Such hydrants are to be attached to mains six (6) inches or larger in diameter. The cost of the hydrant installation shall include the connection at the main, the lateral piping and the valve, as well as the hydrant, together with the cost of installing same. All public hydrants shall be installed in accordance with applicable regulations of the appropriate governmental unit.

Public fire hydrants shall be the property of Water Company and will be maintained by the Water Company.

RULES NO.21- EXTENSION OF MAINS:

The Company will extend its distribution system to supply consumers where application of service has been made, under the following terms and conditions:

- (a) Where the cost of the extension does not exceed three and one half- times annual revenue from bona fide applicants whose pipe will be directly connected to the extension and from whom the Company has received applications for service upon forms provided by the Company for this purpose, the Company will install, at its own cost and expense, the necessary extension.
- (b) When the estimated cost of the extension exceeds three and one-half times the estimated normal annual revenue from bona fida applicants whose service pipes will be directly connected to the extension and from whom the Company has received applications for service upon forms provided by the Company for this purpose, the person seeking the extension will deposit with the Company the difference between the cost estimated by the Company of the construction of the extension including Federal income taxes imposed with respect thereto and three and one-half times the estimated normal annual revenue of the person seeking the extension. Upon completion of the cost of the extension, the computation shall be made to determine the actual cost of the extension (including Federal income taxes). If the deposit differs from the actual cost of the extension, less three and one-half times the estimated normal annual revenue of the depositor, the depositor will deposit any additional amounts shown to be due or the Company will refund to the depositor any excess amount shown to have been deposited. It is the intent that the deposit required should be based on actual installation cost including Federal income taxes.
- (c) Any deposit so made shall remain without interest, in the possession of the Company, subject to refunds as follows:
- (d) When and as additional bona fida consumers are secured whose service lines are directly connected to such extension, the Company will refund to the original depositor or depositors an amount equal to three and one -half times the estimated annual normal revenue from such additional consumers. Refunds will be made for a period of ten years only from date original deposit, and the total of such refunds will in no event exceed the amount of the original deposit. All or any part of the deposit not refunded within said ten year period shall remain the property of the Company.
- (e) The ownership of the extension installed under this rule shall at all times be in the Company, its successors and assigns.

RULE NO. 21 - EXTENSION OF MAINS: (CONTINUED)

- (f) Where the main or extension is to be installed in a private street the owner thereof shall provide, free of cost to the Company, an easement and a free, unobstructed and uninterrupted right of way for the installation, maintenance and extension of the main in such private street, and shall, if requested by the Company, place on public record a facsimile plat showing the location of such street.
- (g) The Company reserves the right to determine the size of the pipe necessary in making such extension, but in no case shall pipe smaller than six (6) inches in diameter be laid except where public fire protection service is not involved.
- (h) Estimated normal annual revenue as used in Rule 21 (a), (b) and (d) and as applying to residential customers, shall be determined each year by computing the average residential revenue of all residential customers for the previous year.