

## FRIPP ISLAND PUBLIC SERVICE DISTRICT

Tuesday, October 11, 2022  
Fripp Island Fire Station  
and  
Electronic Meeting Via Zoom  
9:30 a.m.

### Zoom Info:

Join from PC, Mac, Linux, iOS or Android:

<https://us02web.zoom.us/j/86565978745>

Or iPhone one-tap (US Toll): +19292056099,,86565978745#  
+13017158592,,86565978745#

Or Telephone:

Dial: +1 301 715 8592 (US Toll) or +1 312 626 6799 (US Toll)  
Meeting ID: 865 6597 8745

### AGENDA

1. Call to Order
  - Confirmation of the presence of a quorum
  - Confirmation of public meeting notice, as required by the SC Code of Laws *30-4-80(A)*.
2. Pledge of Allegiance
3. Approval of September Commission Meeting Minutes
4. Reports
  - Manager's Report for September 2022
    - *June 30, 2022 Unaudited Financial Reports*
  - Fire Department Report for September 2022
  - Report on POA Shoreline Committee Activities – Commissioner Wetzel
5. Old Business
  - Application for Residential Landscape Irrigation Meters Policy
  - Resolution Imposing Dedicated Residential Landscape Irrigation Meter Rates for FY2023
  - Revetment Repairs – Quote from Roger Wilson Construction Co.
6. New Business
  - Revised Cross Connection Policy
  - Captain John Fripp Villa Sewer Rehabilitation Study
7. Questions and Comments from Visitors
  - FIPOA Representative
8. Executive Session
  - Legal and Contractual Matters Related to Funding Options for Capital Planning
  - Personnel Matters
9. Upon returning to public session, the Commission may take such action(s) as it deems appropriate on the items discussed in executive session.
10. Adjourn

# FRIPP ISLAND PUBLIC SERVICE DISTRICT

**Minutes:** Commission Meeting on October 11, 2022

**Present:** Michael J. Wilt, John F. King, Rick E. Keup, Edward D. Wetzel, Dan H. McCormick, Dennis Perrone

**Absent:**

**Staff:** Angie Hughes, District Manager; Joshua Horton, Fire Chief; Yvonne Fireall, Office Manager

**Guests:** Gary Pope (Pope Flynn), Tony O'Rourke (FIPOA), Mike Murphy, John Marshall, Gary Nizzi, John Newman, John Derrick

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1. Chairman Wilt called the meeting to order at 9:30 a.m., confirmed the presence of a quorum and confirmed that all requirements of the SC Code of Laws, Section 30-4-80, pertaining to the notice of meetings of public bodies, have been met for this meeting.
2. Chairman Wilt led the Commission in the Pledge of Allegiance.
3. The Commission approved the minutes for the September 2022 regular Commission Meeting, upon a motion by Mr. Wetzel (Vote: unanimous).
4. Reports
  - a) The Commission reviewed the Manager's Report for September 2022 and the unaudited financial statements for June 30, 2022. (*Att A*)
  - b) The Commission reviewed the Fire Department Report for September 2022. (*Att B*)
  - c) The Commission received a report on POA Shoreline Committee activities from Commissioner Wetzel.
5. Old Business
  - a) The Commission reviewed and adopted a policy governing the application for residential landscape irrigation meters, upon a motion by Mr. King (Vote: unanimous). (*Att C*)
  - b) The Commission reviewed and adopted a resolution imposing dedicated residential landscape irrigation meters rates for FY2023, upon a motion by Mr. Keup (Vote: unanimous). (*Att D*)
  - c) The Commission reviewed and approved a quote from Roger Wilson Construction Company for revetment repairs in the amount of \$60,000, to be paid from the remaining 2017 general obligation bonds issued for repairs to erosion control structures, upon a motion by Mr. Keup (Vote: 5:1). (*Att E*)
6. New Business
  - a) The Commission reviewed and discussed a revised cross connection policy and requested that the District Manager complete additional research and provide further revisions at the next Commission meeting. (*Att F*)
  - b) The Commission reviewed and discussed the Captain John Fripp Villas Sewer Rehabilitation Study and requested that the District Manager make arrangements to have the

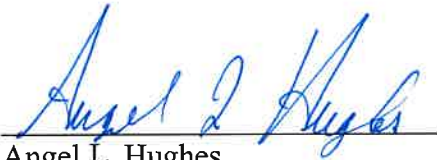
CJFV sewer lines inspected by CCTV to determine which of the rehabilitation options identified in the study were the most feasible. (*Att G*)

7. The Commission entertained questions and comments from visitors.
8. The Commission entered executive session to discuss legal and contractual matters related to funding options for capital planning and personnel matters at 10:51 a.m., upon a motion by Mr. Wetzel (Vote: unanimous). The Commission resumed open session at 12:38 p.m., upon a motion by Mr. King (Vote: unanimous).
9. There being no further business, the meeting adjourned at 12:39 p.m., upon a motion by Mr. Keup (Vote: unanimous).



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Michael J. Wilt  
Chairman



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Angel L. Hughes  
Secretary

ATT A

# **FRIPP ISLAND PUBLIC SERVICE DISTRICT MANAGER'S REPORT FOR SEPTEMBER 2022**

## **I. Tap-Ins**

<u>Category</u>	<u>FY 2023</u>		<u>FY 2022</u>		<u>FY 2021</u>	
	<u>Sept</u>	<u>YTD</u>	<u>Sept</u>	<u>YTD</u>	<u>Sept</u>	<u>YTD</u>
Water customers	1	10	3	6	-	-
Sewer customers						
a. Gravity	1	7	3	5	-	-
b. Vacuum	-	3	-	1	-	-

Total vacuum sewer customers: 590 of 726

## **II. Routine Operations**

### **1. Butcher's Island and Hunting Island Booster Pumps Average Daily Run Time for September**

	<u>2022</u>	<u>Diff</u>	<u>2021</u>	<u>Diff</u>	<u>2020</u>	<u>Diff</u>	<u>2019</u>
Butcher's Isl Pumps Hrs/Day	4.5	(1.5)	6.0	(0.2)	6.2	2.9	3.3
Hunting Isl Pumps Hrs/Day	9.0	(2.9)	11.9	(0.5)	12.4	6.0	6.4
Total Hrs/Day	13.5	(4.4)	17.9	(0.7)	18.6	8.9	9.7

### **2. Fripp Island Master Metered Water Use for September, Average Gallons per Day**

	<u>2022</u>	<u>% Change</u>	<u>2021</u>	<u>% Change</u>	<u>2020</u>	<u>% Change</u>	<u>2019</u>
BJW&SA	597,786	(6.4)	638,893	(3.1)	659,000	24.7	528,563
Harbor Island	90,296	1.8	88,668	(4.4)	92,794	(1.7)	94,428
Hunt Island	8,304	(19.5)	10,311	5.3	9,794	(2.6)	10,059
Frripp Island	482,321	(9.4)	532,286	(1.5)	540,125	23.2	438,500
Accountability,%	97.2	N/A	98.8	N/A	97.5	N/A	102.7
Rainfall, Inches	10.3		8.8		10.9		5.3

### **3. Fripp Island Water Consumption – Recorded vs. Billed (in 1,000 gals.)**

	<u>Annual</u>	<u>Qtr 3</u>	<u>Qtr 2</u>	<u>Qtr 1</u>	<u>Qtr 4</u>
	<u>Total</u>	<u>2022</u>	<u>2022</u>	<u>2022</u>	<u>2021</u>
Frripp Master Meter	164,914	56,707	48,428	26,671	33,108
Billed Water	151,273	52,740	44,995	22,255	31,283
Total Unbilled Water	13,641	3,967	3,433	4,416	1,825
Unbilled Water Percent	8%	7%	7%	17%	6%
Flushing/Unbilled Accts	2,539	239	560	1,250	490
Unaccounted for Water	11,102	3,728	2,873	3,166	1,335
Unaccounted for Percent	7%	7%	6%	12%	4%

### **4. The water tank levels and water line pressures were normal for September.**

### **5. Wastewater Treatment Plant Flow for September, Gallons per Day**

	<u>2022</u>	<u>% Change</u>	<u>2021</u>	<u>% Change</u>	<u>2020</u>	<u>% Change</u>	<u>2019</u>
Average Daily Flow	255,919	0.5	254,539	(8.3)	277,586	40.4	197,751
Weekly Max Flow	345,000	21.5	284,000	(2.1)	290,000	25.5	231,000
Peak Daily Flow	582,904	5.0	555,221	19.2	465,909	20.4	386,847

Peak daily flow of 582,904 occurred on Sat., 9/10/21, without rain and following two days of heavy rain. For Sept. 2021, peak daily flow occurred on Tues., 9/21/21, with 0.9" of rain and following

two days of heavy rain. For Sept. 2020, peak daily flow occurred on Mon., 9/07/20 (Labor Day), without rain. For Sept. 2019, peak daily flow occurred on Fri., 9/06/19, without rain, following restart of the sewer system after returning to the island from evacuation for Hurricane Dorian.

6. The water system and wastewater treatment plant samples were satisfactory for September.

### III. Emergencies, Special Field Work and Activities

#### 1. Water System

- a) Beaufort County was downgraded to “Drought-free” drought status in September.
- b) District field operators performed miscellaneous water system maintenance consisting of meter installations and replacements and repairing leaking water lines and services throughout September.
- c) September 20 – 23 – Meter reading.
- d) September 28 – District Manager and field operations supervisor met with representatives of T-Mobile and Utility Services, Inc. at the 75,000-gallon tank to discuss relocation of T-Mobile’s coax cables to allow for replacement of the dry interior hatch, which is experiencing heavy corrosion. The work will be completed in the next six months.

#### 2. Wastewater System

- a) September 10 – Vacuum sewer station ran for 16 hours. A valve on Marlin Drive was hung open, causing the pumps to run continuously. Operators were able to close the valve but it could not be replaced until rain water receded enough to pump out the valve pit.
- b) September 12 – operators replaced a bad float switch at the Marina pump station.
- c) September 15 – replacement drum screen was delivered. Contractor has been notified and is scheduling the installation.
- d) September 19 – operators pulled pumps at the Fiddlers Ridge lift station and removed rags (wet wipes). The #1 pump was burned up and the station is running on one pump. New pumps and control panel have been ordered.
- e) September 21 – operators pulled #2 pump at Fiddlers Ridge lift station and removed rags.
- f) September 23 – operators pulled #2 pump at Fiddlers Ridge lift station and removed rags. Additional pumping was done to remove as many rags as possible from the system before putting the pump back in service.

#### 3. Administrative & Personnel Activities

- a) The District has a new IT support vendor, Carolina IT, and will transition to Carolina IT’s support platform during the last two weeks in November. Carolina IT is based on Hilton Head and is available to provide on-site support at a lower cost to the District.
- b) Since financial and billing software procurement was not included in the FY 2023 budget, this effort has been postponed. Changes of this magnitude can be problematic for a limited staff and the District’s current vendor has been asked to provide information about additional functionalities that could be implemented within the existing software. If the results of this query are not satisfactory, the proposed procurement will be revisited during the FY 2024 budgeting process.
- c) Management is working on a draft of a revised drought response regulation that will coordinate and consider BJW&SA’s drought management plan and Beaufort County’s ordinance. BJW&SA intends to update their plan in the next year – it might be beneficial to defer update of the District’s policy until they have completed their update.

#### 4. Hunting Island Booster Pump Station Rehab –SCADA work was completed September 14<sup>th</sup>, and the station placed in service. Electrical service to the old station was disconnected the following week. Demolition of the old station and installation of the driveway should be completed within the next month.

5. Captain John Fripp Villas Sewer Rehab Study – Ongoing. Survey is complete and engineer is working on completing the study, cost estimates and recommendations. A draft report will be on the agenda for the October Commission meeting.
6. Fripp Inlet Bridge – The grant application was submitted on the September 12<sup>th</sup> deadline. Awards will be made during the first quarter of 2023. The bent analysis confirmed that bents 12 and 13 are below the recommended safety factor of 2 and should be retrofitted – the estimated cost of this work was included in the grant application. The bridge replacement cost estimate update will be completed in October.
7. Seaglass Development – Still in the design and County review phase. The developer provided a report on collection capacity for the Ocean Creek/Davis Love area that has been reviewed by District staff and forwarded it to the District's engineer. The current collection system does not appear adequate to handle the additional flows from the development and the developer will be required to upgrade the system to the level needed.
8. Election of Commissioners – Two Commission seats will be up for election in the November 2022 general election. Four individuals submitted Statements of Candidacy by the August 15, 2022 deadline. Short questionnaires completed by each candidate were published in the September edition of the Trawler.

**FRIPP ISLAND PUBLIC SERVICE DISTRICT**  
July 1, 2021 through June 30, 2022 Statement  
of Revenues & Expenses  
Water & Wastewater Operations

	Actual	Budget	Variance Favorable (Unfavorable)	Variance Comments
Operating revenues				
Water operations	1,106,960	1,077,470	29,490	Misc income
Water Tank Leases	283,486	299,530	(16,044)	Timing of deposits
Wastewater operations	787,873	747,570	40,303	Sewer usage, tap fees, effl disp
Total operating revenues	2,178,319	2,124,570	53,749	
Cost of sales	(522,958)	(537,870)	14,912	
Gross profit from operations	1,655,361	1,586,700	68,661	
Operating expenses				
General & administrative	677,767	748,470	70,703	Salaries, insurance & consulting
Water system expenses	87,161	86,930	(231)	
Wastewater expenses	314,018	382,030	68,012	wwtp, force mains
Total operating expenses	1,078,946	1,217,430	138,484	
Earnings (loss) from operations	576,415	369,270	207,145	
Nonoperating income (expenses)				
Interest earned	63,734	62,750	984	
Taxes & assessments collected	978,385	977,430	955	
Capital & Unrealized Inv Gain (Loss)	(348,451)	-	(348,451)	unrealized investment losses
Interfund Transfers (Out)	(2,606)	-	(2,606)	reallocated surplus to FD-appr fy21
Bond interest & expenses	(147,941)	(147,990)	49	
Net nonoperating income (expenses)	543,121	892,190	(349,069)	
Earnings (loss) before depreciation	1,119,536	1,261,460	(141,924)	
Depreciation/Loss on disposal	599,062	607,670	8,608	
Net earnings (loss)	520,474	653,790	(133,316)	
Cash available on July 1, 2021			7,053,906	
Earnings (loss) before depreciation & debt amortization			1,119,536	
Changes in assets & liabilities				
(Increase) decrease in accounts receivable			(13,711)	
(Increase) decrease in inventory			(6,641)	
(Increase) decrease in prepaid expenses			(5,683)	
(Decrease) increase in accounts payable & transfers			(10,930)	
(Decrease) increase unrealized gains			-	
Net cash provided (used)			(36,965)	
Cash flow from capital & financing activities				
Asset additions/deletions & construction in progress			(284,787)	
Principal payments on bonds & deferred debt			(827,685)	GO bonds (WWTP & WL) & Rev bond
Bond proceeds & contributed capital			-	
Net cash provided (used)			(1,112,472)	
Cash available on June 30, 2022			7,024,005	
Available cash includes following balance sheet accounts:	Beginning	Ending	Change Pos. (Neg.)	
Cash (gross revenue, petty cash & contingency fund)	3,055,582	3,155,257	99,675	
Due from Beaufort County Treasurer (Vac sewer assessments)	374,195	381,365	7,169	
Investments & restricted cash (Sewer const fund, DS, invest.)	3,624,129	3,487,384	(136,745)	
Total	7,053,906	7,024,006	(29,900)	

**FRIPP ISLAND PUBLIC SERVICE DISTRICT**

July 1, 2021 through June 30, 2022  
Statement of Revenues & Expenses  
Fire Department & Erosion Operations

	Fire Department Fund			Erosion & Bridge Operations Fund		
	Actual	Budget	Variance Favorable (Unfavorable)	Actual	Budget	Variance Favorable (Unfavorable)
<b>Revenues</b>						
Taxes & penalties	591,710	569,374	22,336	210,381	198,340	12,041
Assessments, donations & FIPOA	9,200	3,000	6,200	-	-	-
Utility attachment fees	-	-	-	18,576	18,570	-
*Interest, cap gain (loss) & miscellaneous	7,590	-	7,590	(12,364)	3,840	(16,204)
<b>Total Revenues</b>	<b>608,500</b>	<b>572,374</b>	<b>36,126</b>	<b>216,593</b>	<b>220,750</b>	<b>(4,163)</b>
<b>Expenditures</b>						
Employee expenses	492,394	398,228	(94,166)	-	-	-
General & Administrative	83,826	63,458	(20,368)	143,317	134,380	(8,937)
Operations	18,372	25,013	6,641	66,519	59,000	(7,519)
<b>Total Operating Expenses</b>	<b>594,592</b>	<b>486,699</b>	<b>(107,893)</b>	<b>209,836</b>	<b>193,380</b>	<b>(16,456)</b>
Bond Interest & expenses	-	-	-	-	-	-
Capital outlay	1,801	11,000	9,199	-	-	-
<b>Total Expenditures</b>	<b>596,393</b>	<b>497,699</b>	<b>(98,694)</b>	<b>209,836</b>	<b>193,380</b>	<b>(16,456)</b>
<b>Revenues over (under) expenditures</b>	<b>12,107</b>	<b>74,675</b>	<b>(62,568)</b>	<b>6,757</b>	<b>27,370</b>	<b>(20,613)</b>
 Cash available July 1, 2021	 658,535	 471,756	 186,779	 730,932	 724,720	 6,212
Revenues over (under) expenditures	12,107	74,675	(62,568)	6,757	27,370	(20,613)
Increase (decrease) payables & transfers	(174,970)	-	(174,970)	15,321	(3,630)	18,951
<b>Cash available June 30, 2022</b>	<b>495,672</b>	<b>546,431</b>	<b>(50,759)</b>	<b>753,011</b>	<b>748,460</b>	<b>4,551</b>

\*Includes interfund transfers from General Fund to cover additional capital costs from FY2021

**CAPITAL PROJECT ACTIVITIES SUMMARY**

	Bridge	Revetment	Totals
Cash available July 1, 2021	267,683	92,497	360,180
Revenues (bank interest/FEMA funds)	-	-	-
Less admin exp (bank chgs)	-	-	-
Less operations fund reimbursements	-	-	-
Less bond-related expenses (P&I, misc)	-	-	-
Less capital outlay	(3,703)	-	(3,703)
<b>Cash available June 30, 2022</b>	<b>263,980</b>	<b>92,497</b>	<b>356,477</b>



**FRIPP ISLAND PUBLIC SERVICE DISTRICT**  
July 1, 2021 through June 30, 2022  
Statement of Revenues & Expenses  
Debt Service Fund

	Actual	Budget	Variance Favorable (Unfavorable)	Comments
<b>Revenues</b>				
Tax levies-wwtp, waterline, bridge, revetment	822,551	807,000	15,551	increase in mil value
Service assessments	-	-	-	
Interest, penalties & misc	5,868	-	5,868	pen & interest
<b>Total Revenues</b>	<b>828,418</b>	<b>807,000</b>	<b>21,418</b>	
<b>Expenditures</b>				
Interfund Transfers (wwtp & wtrline GO bond P&I)	610,394	612,000	1,606	
Governmental bonds (revtmt & bridge P&I)	223,736	225,000	1,264	
Bond payment fees	-	-	-	
<b>Total Expenditures</b>	<b>834,130</b>	<b>837,000</b>	<b>2,870</b>	
<b>Revenues over (under) expenditures</b>	<b>(5,712)</b>	<b>(30,000)</b>	<b>24,288</b>	
 Cash available July 1, 2021	 409,194	 392,000	 17,194	
Revenues over (under) expenditures	(5,712)	(30,000)	24,288	
Increase (decrease) payables & transfers	-	-	-	
<b>Cash available June 30, 2022</b>	<b>403,482</b>	<b>362,000</b>	<b>41,482</b>	

For 1st quarter budget, assume zero tax revenue. Actual taxes collected during 1st quarter are delinquent taxes for prior fiscal year. Budget assumes 50% collection in 2nd quarter & 50% collection in 3rd quarter.

Expenditures include interfund transfers of quarterly SRF (wwtp & wl) & biannual BB&T (revetment & bridge) debt payments.

Available cash on July 1, 2022 needs to be sufficient to cover Sept. 1, 2022 revetment biannual debt payment of \$7,780, Oct 1 & Dec 1, 2022 wwtp & wl quarterly debt payments totalling \$305,220, and Oct. 1, 2022 bridge biannual debt payment of \$38,350 (Grand Total - \$351,350)

**FRIPP ISLAND PUBLIC SERVICE DISTRICT**  
 Combined Balance Sheet  
 All Fund Types and Account Groups  
 June 30, 2022

	Proprietary Fund Type	Governmental Fund Types					Totals
		Erosion & Bridge	Fire Dept.	Debt Service	Capital Projects	June 2022	
<b>ASSETS</b>							
Available Cash	3,155,257	92,911	22,645			3,270,813	
Due from Beaufort County Treasurer	381,365	549,975	468,671	403,482		1,803,492	
Accounts receivable water & sewer system	472,570					472,570	
Accounts receivable-other	18,668		4,356			23,024	
Interfund receivable / transfer accounts						-	
Inventory	29,391					29,391	
Prepaid expenses	41,422					41,422	
Restricted cash, debt service funds & investments	3,487,384				356,477	3,953,986	
Fixed assets (net of accumulated depreciation)	12,931,385					12,931,385	
Unamortized debt acquisition costs	-					-	
Deferred Outflows-Pension & OPEB	190,339					190,339	
Amount provided for retirement of long term debt	-					-	
Total Assets	20,707,782	753,011	495,672	403,482	356,477	22,716,423	
<b>LIABILITIES</b>							
Vouchers & accounts payable	113,988	15,468	13,631			143,088	
Accrued employee expenses	18,725		2,456			21,181	
Payable from restricted assets (accrued bond int.)	39,228					39,228	
Deferred revenue & receivable clearing accounts	(176)					(176)	
General obligation & revenue bonds payable	6,513,382					6,513,382	
Pension & OPEB liability & deferred inflows	1,247,947					1,247,947	
Interfund payable / transfer accounts	913		(913)			-	
Total liabilities	7,934,007	15,468	15,174	-		7,964,650	
<b>FUND EQUITY</b>							
Beginning Fund Balance/Net Position	12,253,300	730,785	468,390	409,194	360,180	14,221,849	
Fund Balance/Net Position YTD increase (decrease)	520,474	6,757	12,107	(5,712)	(3,703)	529,924	
Total fund equity	12,773,774	737,543	480,497	403,482	356,477	14,751,773	
Total liabilities & fund equity	20,707,782	753,011	495,672	403,482	356,477	22,716,423	

# ***Fripp Island Fire Department Monthly Report Summary September 2022***

## **Response Activities:**

Total emergency responses for September 13

	Sept 2022	Sept 2021	YTD CY22	YTD CY21
• Structure Fires	00	00	02	01
• Vehicle Fire	00	00	00	01
• Medical Emergencies	06	13	113	110
• Brush Fires	00	00	00	02
• Misc. Fire	01	01	23	29
• Service Calls	01	01	13	19
• Mutual Aid	01	00	06	03
• Auto Accident	01	01	08	13
• Water Emergencies	03	00	14	06
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	13	16	179	184

## **Average emergency response time:**

4 minutes 30 seconds.

## **Inspections:**

Sept 2022	Sept 2021	YTD CY22	YTD CY21
0	0	0	0

## **Training Activities:**

No training for September.

## **Roster:**

Total personnel active for September, 22

Vol.-01

Paid-21

October 5, 2022

Ms. Angie Hughes  
General Manager  
Fripp Island Public Service District  
291 Tarpon Boulevard  
Fripp Island, SC 29920

**Subject: PROPOSED IRRIGATION METER BASE CHARGE**

Ms. Hughes:

Per your request, Confluence Consulting, LLC (Confluence) is pleased to provide a proposed quarterly irrigation base charge to the Fripp Island Public Service District (FIPSD) for residential water customers that may request separate meters for outdoor water use. On July 1, FIPSD implemented a new utility rate structure that introduced wastewater consumption rates for its residential customers and a modified water conservation rate structure designed to be more equitable in recovering the higher costs of discretionary water use.

The previous wastewater rate structure, which consisted of a flat quarterly rate only for residential customers, did not recognize that residential customers discharge varying amounts of wastewater into the FIPSD wastewater system depending on the amount of their indoor water use. To recognize that a portion of a residential customer's water consumption is for outdoor water use that is not returned to the wastewater system, the new wastewater rate structure incorporates a wastewater usage cap of 36,000 gallons per quarter. Additionally, the modified water consumption rates were designed to provide a greater incentive for water conservation during the seasonal months by recovering more costs from higher use discretionary water use.

Because much of the higher seasonal water use is for irrigation purposes, the Commissioners recognize that some residential customers with irrigation systems may be interested in having a separate water meter installed for outdoor water use. Metering outdoor water usage separately could allow residential customers to avoid having some portion of their outside water use being assessed the new wastewater consumption rate. Those residential customers that install a separate irrigation meter would only be charged wastewater for water use metered on the domestic (indoor) water meter. However, the 36,000 gallon per quarter wastewater usage cap would no longer apply to those residential customers with an irrigation meter. Additionally, it should be noted that all water use associated with a separate residential irrigation meter will be charged at the \$4.68 per 1,000 gallons third tier rate. This is because the tier three consumption rate is designed to recover discretionary outdoor water use.

Since residential customers already pay a water base charge for their current water meter, the Commissioners requested to have a separate base charge applicable for the separate irrigation meter. This separate irrigation base charge is designed to recognize that these residential customers already pay

for the fixed costs of their capacity through their current water base charge. For this reason, the quarterly irrigation base charge was calculated to recover only those fixed costs associated with the administrative costs that are recovered equally from all water accounts.

Table 1 presents the fixed customer costs recovered through the quarterly water base charge in comparison with the customer costs recovered through the proposed quarterly irrigation base charge for fiscal year (FY) 2023.

**Table 1: Fixed Customer Costs Recovered through Quarterly Water Base Charges**

Fixed Customer Costs	Water Base Charge	Irrigation Base Charge
General & Administrative <sup>1</sup>	\$ 387,406	\$ 284,180
Meters	15,759	-
Hydrants	3,000	-
Debt Service	167,462	-
Rate Funded Capital	85,000	-
Bond Coverage	(3,200)	-
<b>Total Costs to Recover</b>	<b>\$ 655,427</b>	<b>\$ 284,180</b>
Less: Revenue Offsets <sup>2</sup>	\$ (228,146)	\$ (60,683)
<b>Net Customer Costs to Recover</b>	<b>\$ 427,282</b>	<b>\$ 223,496</b>

- 1 The irrigation base charge Includes a 50% allocation of G&A personnel costs only. No debt service or other capital costs are recovered through the irrigation base charge since these costs are already recovered through domestic water meter base charge.
- 2 The revenue offsets for the irrigation base charge exclude the interfund transfers associated with the debt service payments that are funded through ad valorem taxes since no capacity costs are recovered through the irrigation base charge.

To determine the proposed quarterly irrigation base charge, the net customer costs to be recovered are divided by the annual equivalent meter units which represent the number of customer account equivalents based on the number of multiple units served per meter and meter size. FIPSD's quarterly base charges are assessed based on the number of units served by a meter and charges higher base charges to commercial customers with larger meters that require more system capacity. The annual equivalent meter units represent the forecasted number of these equivalents that will be billed during FY 2023 (2,065 \* 4 quarterly billings).

Table 2 presents the calculation of the quarterly water base charge and proposed quarterly irrigation base charge for FY 2023.

*Table 2: Calculation of Water Base Charge and Proposed Irrigation Base Charge*

Quarterly Base Charge Calculation	Water Base Charge	Irrigation Base Charge
Customer Costs	\$ 427,282	\$ 223,496
Annual Equivalent Meter Units <sup>1</sup>	8,262	8,262
Quarterly Base Charge per Equivalent Residential Unit (ERU)	\$ 51.70	\$ 27.05

As Table 2 demonstrates, excluding the customer capacity and other costs associated with the domestic water meter base charge results in a quarterly irrigation base charge that is approximately 48% less than the quarterly water base charge. Because the irrigation base charge only recovers account related fixed costs and FIPSD will only offer 5/8-inch meters for residential irrigation purposes, the \$27.05 irrigation base charge will apply to all residential irrigation meters.

It should be noted that the calculation of the proposed FY 2023 irrigation base charge is based on the estimated number of annual equivalent meter units as of the time of the determination of the current water base charge. There are currently no residential irrigation meters connected to the FIPSD water system. Should FIPSD install residential irrigation meters in the future, the updated quarterly base charges would need to consider the number of additional irrigation meters in the calculation of both base charges.

I appreciate the opportunity to assist the FIPSD in determining this proposed quarterly irrigation base charge. If you have any questions related to the methodology and costs recovered through the irrigation base charge, please do not hesitate to contact me at (704) 577-8133 or fdavis2238@gmail.com.

Sincerely yours,

**CONFLUENCE CONSULTING, LLC.**



**Frank Davis**  
*President*

**FRIPP ISLAND PUBLIC SERVICE DISTRICT  
APPLICATION FOR RESIDENTIAL LANDSCAPE IRRIGATION METER**

**Policy:** The Public Service District will install a second residential water meter for the purpose of connection to a landscape irrigation system at the customer's request upon payment of applicable fees.

**Procedure:** To establish a procedure for submission of residential landscape irrigation meter requests by residential customers, to establish the responsibility of both the District and the applicant as related to installation and protection of the residential landscape irrigation water meter, and to establish billing procedures for residential properties with separate landscape irrigation meters.

**Administration:** Residential Landscape Irrigation Meter Requests:

1. Application for a residential landscape irrigation meter shall be made by the owner of the property or the owner's contractor, using the standard form of the District. The application shall be submitted to the District, with the applicable tap fee, at least two weeks prior to the desired service installation date. The fee for installation will be the current residential meter tap fee. Application approval is dependent upon equipment and supplies availability. A non-refundable administrative fee in accordance with the current rate schedules will apply.
2. The District will install the water meter and connect it to the existing service line. A new tap on the water main will not be made for a residential landscape irrigation meter. The meter will not be located within a driveway or walkway, or under any paved or concrete surface.
3. Connection of the customer's irrigation system to the new meter is the responsibility of the applicant. Failure to fully disconnect the landscape irrigation system from the residential domestic-use water meter could result in incorrect sewer bills. Adjustments for such billing inaccuracies will not be provided.
4. Residential landscape irrigation meters must adhere to the District's Cross Connection Policy requiring the installation of a testable backflow prevention device. The backflow prevention device installation and annual testing is the responsibility of the customer as described in the Cross Connection Policy.
5. Any damage to the District's water system, sewer system, water meter, or service laterals by the applicant or caused by any activity under the control, direction, or request of the applicant, shall be repaired by the District, and the cost of the repairs shall be paid by the applicant upon receipt of an invoice from the District. Service may be terminated if such charges are not paid.


**FRIPP ISLAND PUBLIC SERVICE DISTRICT  
APPLICATION FOR RESIDENTIAL LANDSCAPE IRRIGATION METER**

6. Residential landscape irrigation meters will be subject to billing rates as imposed by the District's current rate schedules and charges will be billed to the applicant's existing water/sewer account. After the residential landscape irrigation meter is installed, the water/sewer account will be billed volumetric sewer charges for all water use recorded by the residential domestic-use water meter. Sewer charges will not apply to the water usage recorded by the residential landscape irrigation meter.
7. Water meters will be read quarterly and bills will be mailed within ten business days of the end of a service period. Payment must be made by the "Due Date" indicated on the bill.
8. Requests for termination of service to a residential landscape irrigation meter should be submitted to the District by the property owner in writing or by telephone at least five (5) business days prior to the date the owner would like the service terminated. Service terminated at the owner's request may be subject to reconnection fees.


Authority: This policy approved and adopted by the Fripp Island Public Service District on October 11, 2022, to become effective immediately.

**This Policy approved and adopted by the FRIPP ISLAND PUBLIC SERVICE DISTRICT COMMISSION on October 11, 2022.**

(SEAL)

  
\_\_\_\_\_  
Chairman  
Fripp Island Public Service District  
South Carolina

Attest:

  
\_\_\_\_\_  
Secretary  
Fripp Island Public Service District  
South Carolina



Att D

**RESOLUTION  
DEDICATED RESIDENTIAL LANDSCAPE IRRIGATION METER RATES FOR  
FISCAL YEAR 2023**

**DEDICATED RESIDENTIAL LANDSCAPE IRRIGATION METER RATES FOR THE  
FISCAL YEAR STARTING JULY 01, 2022 AND ENDING JUNE 30, 2023**

**WHEREAS**, the Fripp Island Public Service District adopted a water and sewer rates schedule for the fiscal year starting July 01, 2022 and ending June 30, 2023 on June 14, 2022, and

**WHEREAS**, the Fripp Island Public Service District adopted a new policy allowing and governing the installation of dedicated residential landscape irrigation meters on properties already supplied with an existing residential domestic-use meter on October 11, 2022, and

**WHEREAS**, the water and sewer rates schedule adopted on June 14, 2022 did not provide for rates applicable to dedicated residential landscape irrigation meters

**NOW, THEREFORE, BE IT RESOLVED**, that the following rates for dedicated residential landscape irrigation meters will be in effect for the fiscal year starting July 01, 2022.

**DEDICATED RESIDENTIAL LANDSCAPE IRRIGATION WATER RATES**

Base Bill/Quarter	\$27.05
Water Consumption	\$4.68/1,000 gals.


**This Resolution ratified and adopted by the FRIPP ISLAND PUBLIC SERVICE  
DISTRICT COMMISSION on October 11, 2022.**

**FRIPP ISLAND PUBLIC SERVICE DISTRICT  
COMMISSION**



\_\_\_\_\_  
Chairman, Fripp Island Public Service District  
Commission

(SEAL)  
Attest:

  
\_\_\_\_\_  
Secretary, Fripp Island Public Service District  
Commission

ATT E

## ROGER WILSON CONSTRUCTION COMPANY

492 Porpoise Drive  
 Fripp Island, SC 29920  
 (843) 838-4392

## PURCHASE ORDER NO.

THIS NUMBER MUST APPEAR ON ALL INVOICES, SHIPPING PAPERS, PACKAGES, ETC.

DATE

9/26/22

DATE REQ.

SHIP VIA

FOB

TERMS

SOLD TO

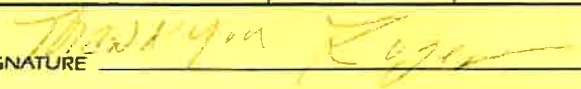
SHIPPED TO

FI PSD

Quote:

QUANTITY	UNIT	DESCRIPTION	UNIT PRICE	TOTAL PRICE
		place 200 tons ARMOR R.P RAP ON SLUMPING AREAS.		
		200 tons @ 300 <sup>00</sup> p/ton 60,000 <sup>00</sup>		

AUTHORIZED SIGNATURE



## FRIPP ISLAND PUBLIC SERVICE DISTRICT CROSS CONNECTION POLICY

**POLICY:** The District shall require the use of backflow prevention devices on all existing and future connections to its water system. Such backflow prevention devices shall meet or exceed the South Carolina State Primary Drinking Water Regulations R.61-58.7 (F), ~~and~~ and shall be tested and/or replaced in accordance with R.61-58.7 (F).

**PURPOSE:** To establish a uniform policy and procedure for the District to comply with State-mandated regulations regarding potential cross connections within its public water system.

**PROCEDURE: Single-family Residential Water Services**

1. All single-family domestic-use residential water services shall have a dual check backflow prevention device installed by District personnel at the time the water meter is installed.
2. Any existing single-family domestic-use residential water service that does not have a dual check backflow prevention device installed shall have one installed upon the replacement of the water meter serving the property.
3. Dual check backflow prevention devices installed on residential domestic-use water services shall be replaced upon replacement of the water meter serving the property.
4. Any existing ~~single family~~single-family residence as of June 8, 2010 ~~that uses~~with an available water source other than an approved public water supply for landscape irrigation including, but not limited to, wells, irrigation lagoons or ponds and cisterns, shall be considered a low hazard cross connection and must follow the procedures for "Low Hazard Cross Connections."
5. The physical connection of an existing alternate water source to the District's approved public water supply shall not be permitted. Connection of an alternate water source to the District's approved public water supply shall result in termination of service until the customer provides satisfactory evidence of disconnection.
6. For ~~single~~single-family residences requesting water service after June 8, 2010, the installation of alternate water sources shall be prohibited.
7. Any residential lawn irrigation system that uses a dedicated irrigation meter shall be considered a low hazard cross connection and must follow the procedures for "Low Hazard Cross Connections."
- 7.8. Any residential lawn irrigation system that includes chemical addition shall be considered a high hazard cross connection and must follow the procedures for "High Hazard Cross Connections."

### Low Hazard Cross Connections

1. All landscape irrigation systems, excluding those single-family systems connected to a domestic-use residential meter, not classified as single-family residential systems and that do not include chemical addition shall be protected by an approved double check valve assembly backflow prevention device installed at the owner's expense. Examples within this category include, but are not limited to, residential irrigation systems using a separate, dedicated meter, irrigation systems for road right-of-ways, common areas, multi-family complexes, offices, shops and other public buildings.



## **FRIPP ISLAND PUBLIC SERVICE DISTRICT CROSS CONNECTION POLICY**

2. Any existing ~~single-family~~ single-family residence as of June 8, 2010 ~~that uses a~~ with an available water source other than an approved public water supply for landscape irrigation including, but not limited to, wells, irrigation lagoons or ponds and cisterns, shall be protected by an approved double check valve assembly backflow prevention device installed at the owner's expense.
3. All swimming pools and bath facilities not classified as single-family residential shall be protected by an approved double check valve assembly backflow prevention device installed at the owner's expense.
4. All water services with fire line sprinkler systems, except those serving a ~~single-family~~ single-family residence or classified as a "high hazard cross connection", shall be protected by a double check valve assembly backflow prevention device installed at the owner's expense.

### **High Hazard Cross Connections**

1. Any connection to the District's water system that may have any material in the water dangerous to health or handles or stores any material dangerous to health that may be handled under pressure or subject to negative pressure shall be protected by an approved reduced pressure principle backflow prevention device installed at the owner's expense. Examples include, but are not limited to wastewater treatment facilities, golf maintenance facilities, chemical storage areas, laundry facilities, and equipment maintenance areas.
2. Any landscape irrigation system that includes chemical addition shall be protected by an approved reduced pressure principle backflow prevention device installed at the owner's expense.
3. High hazard fire sprinkler systems shall be protected by an approved reduced pressure principle backflow prevention device installed at the owner's expense. High hazard fire sprinkler systems shall include, but not be limited to: antifreeze systems, foam systems, systems charged from or tied into ponds, lakes, streams, or any water source other than the approved public water system.
4. Reduced pressure principle backflow prevention devices shall not be installed in a manner or in any location subject to possible flooding. This includes pits or vaults which are not provided with a gravity drain to the ground's surface that is capable of exceeding the discharge rate of the relief valve.

### **Annual Backflow Prevention Device Testing**

1. -The District shall require annual testing at the owner's expense of all backflow prevention devices installed on water services identified as low and high hazard cross connection.
2. The District shall mail the approved backflow prevention device test report form to the service owner and shall require the original, completed form to be returned to the District's administrative office no later than two (2) months after the form was mailed to the customer.
3. Should the service owner fail to return the completed test form within the time frame allotted, a reminder letter shall be mailed. The reminder letter shall include another copy of the test report form and shall state that if the form is not returned within thirty (30) days, the water service will be disconnected from the public water system. Should a water service be disconnected from the public water system for failure to return the required backflow prevention device test report form, it shall remain off until satisfactory arrangements for testing have been made, at the discretion of the

**FRIPP ISLAND PUBLIC SERVICE DISTRICT  
CROSS CONNECTION POLICY**

District Manager. A reconnection fee in accordance with the current rate schedule shall be added to the water service account upon reconnection.

AUTHORITY: This policy approved and adopted by the Fripp Island Public Service District Commission on ~~June 8, 2010~~October 11, 2022, to become effective immediately. This policy replaces the policy adopted June 8, 2010.

This Policy approved and adopted by the FRIPP ISLAND PUBLIC SERVICE DISTRICT COMMISSION on ~~June 8, 2010~~October 11, 2022.

(SEAL)

James L. Parks, Chairman  
Fripp Island Public Service District  
South Carolina

Attest:

Marion E. Wilson, Secretary  
Fripp Island Public Service District  
South Carolina

# **Captain John Fripp Villas Sewer Rehabilitation Study**

**Prepared For:**

**Fripp Island Public Service District**

**Prepared By:**

**Lowcountry Engineering Consultants, LLC  
Consulting Engineers  
Beaufort, South Carolina**

**October 2022**

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## **APPENDIX A**

<b>SK-1 Existing Layout</b>
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<b>SK-3 Option A – Offline Sewer Replacement Layout</b>
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## **APPENDIX B**

<b>Cost Estimate: Option A – Offline Sewer Replacement</b>
<b>Cost Estimate: Option B – Cured-In-Place-Pipe Lining (CIPP)</b>

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## INTRODUCTION

Lowcountry Engineering Consultants, LLC (LEC) was tasked by the Fripp Island Public Service District (FIPSD) to prepare a sewer rehabilitation study of the Captain John Fripp Villas' sewer infrastructure.

## EXISTING CONDITIONS

The villas are located off Tarpon Boulevard on Fripp Island, South Carolina. There are approximately 100 condominiums served by the villas' existing sewer system. No design or record drawings of the villas or existing sewer were available. Based on local knowledge, we believe the Captain John Fripp Villas and sewer were built in the mid-1960s. The FIPSD took ownership of the existing sewer in 1994.

The 50+ year-old sewer infrastructure at Captain John Fripp Villas is a combination of sewer service lines from each villa that connect to a 6" or 8" main gravity sewer line (see exhibits SK-1 to SK-4 in Appendix A). The service laterals and gravity sewer lines are clay, shallow, and not laid in a straight line. Additionally, a significant section of the existing main sewer pipe and laterals lies under concrete patios. The sewer system has (4) shallow brick manholes (MH#3 to MH#6). An 8" clay gravity sewer line runs from the villas' sewer (MH#3) to an existing shallow manhole on the south side of Tarpon Boulevard (MH#2). An 8" PVC sewer line runs from MH#2, under Tarpon Boulevard, to a drop manhole (MH#1). The sewer eventually discharges into an existing pump station at the Fripp Island Racquet Club. The table below provides a summary of the existing sewer line characteristics:

Sewer Line	Location	Size & Material	Length	Slope
A	MH#1 – MH#2	8" PVC	89 LF	1.00%
B	MH#2 – MH#3	8" CLAY	221 LF	0.45%
C	MH#3 – MH#4	6" & 8" CLAY	268 LF	1.20%
D	MH#3 – MH#5	6" CLAY	114 LF	0.33%
E	MH#5 – MH#6	6" CLAY	273 LF	1.00%

The installation methods and pipe materials that were used in the mid-1960s are typically no longer used. SCDHEC's *R61-67 Standards for Wastewater Facility Construction* specifies a minimum cover of 3'-0" over sewer lines. The existing sewer lines, for the most part, do not have the 3'-0" cover required by SCDHEC regulations. Old clay sewers often have numerous failing

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joints, insufficient bedding, cracks, and holes and are probably in need of repair or replacement. Failed joints and existing cracks in clay pipe allow for extensive inflow & infiltration. Additionally, leaks at failing joints or cracks can cause soil to be washed from beneath the pipe. This soil subsidence can lead to the pipe deflecting causing blockages and may ultimately lead to failure.

Due to the age and condition of the sewers and the ongoing maintenance issues with the sewer lines the FIPSD has decided to explore replacing or rehabilitating the sewer infrastructure at the villas. This study explores different options for replacing or rehabilitating the existing sewer infrastructure at the villas and provides a cost estimate for selected options.

## **SCOPE OF STUDY**

These options and the cost estimate for each are included in this report. This study examines each option to determine the most cost-effective and reliable method of replacing or rehabilitating the sewer. LEC considers constructability, length of service interruption, and sequencing of construction in the options listed below.

The inverts of the existing manholes were surveyed to establish a starting point for a preliminary sewer design. Additionally, the interior courtyard of the villas was surveyed, and as-built drawings of existing conditions were prepared. The as-built drawings show the back of the villas, manholes, clean-outs, concrete patios, the pool, and existing sidewalks. The survey data and as-built drawings aided in identifying different options for replacing/rehabilitating the sewer.

## **SEWER REPLACEMENT AND REHABILITATION OPTIONS**

Two main options were considered. The first option is the offline sewer replacement of the existing clay sewer pipes and brick manholes with new PVC sewer pipes and new concrete manholes. For this option, a separate new sewer is constructed parallel to the existing sewer which allows, in theory, the existing system to remain functional during installation of the new sewer.

The second option evaluated is sewer rehabilitation using trenchless sewer repair methods. Trenchless sewer repair such as Cured-In-Place Pipe (CIPP), slip-lining, and pipe bursting, are all

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sewer rehabilitation methods that restore sewer pipe without trenching. The intent of sewer rehabilitation by a trenchless sewer repair is to structurally renew the main line and laterals to prevent infiltration of groundwater, wastewater exfiltration, and root intrusion. The application of a trenchless sewer repair is dependent on the existing clay pipe not being extensively damaged.

In the study, the (3) methods mentioned above, CIPP, slip-lining, and pipe bursting, were evaluated. For each trenchless sewer repair, the existing clay pipe must be inspected via closed-circuit television (CCTV) to determine the condition of the existing clay pipe and to locate lateral tie-ins. If the existing pipe is damaged, it will require repair by grouting before the trenchless repair can begin. If severely damaged or collapsed, the pipe will require localized replacement. After the rehabilitation of the sewer lines, the pipe will require inspection via CCTV to ensure the system was installed properly and that all lateral tie-ins were sealed correctly.

#### **Option A – Offline Sewer Replacement**

The first option considered, offline sewer replacement, involves the installation of a new sewer system while the existing sewer system remains intact. New PVC sewer pipe and concrete manholes are installed without regard to the line and grade of the existing clay pipe. The new 8" PVC pipe will be installed at a minimum slope (0.33% slope) and will be installed with a minimum of 3'-0" cover. The existing clay pipes will be abandoned in place and existing manholes removed once the new PVC pipe is in service and after all service laterals have been relocated from the existing lines. Existing sewer laterals will be maintained and connected to new PVC lateral extensions extending from the newly installed sewer. Listed below are the primary tasks required for Option A – Offline Sewer Replacement (see SK-2 & SK-3 in Appendix A):

1. Install new 8" PVC pipe and concrete manholes from MH#3A to MH #6A including a stub out from new MH#3A toward MH#2A.
2. Install bypass pumping system from MH #3A to MH#2A, existing sewer to remain in service.
3. Start relocating sewer connections from the existing sewer to the new sewer. New PVC sewer laterals will connect to existing sewer laterals.
4. Once all services are relocated, begin demolition of existing MH#3 and the existing 8" clay sewer line connection MH#3 and MH#2.

5. Start installing the new 8" PVC from the stub out at MH#3A to MH#2A. An open cut of the Captain John Fripp Villas Access Road will be required.
6. Once the line is close to existing MH#2, install a bypass system from MH#2 to MH#1 including protection of the temporary FM crossing Tarpon Boulevard.
7. The bypass system at MH#2 must account for flows from existing sewer lines from the east and west.
8. Remove existing MH#2 and replace it with a new concrete manhole, MH#2A.

An alternative to replacing the existing sewer between MH#2 and MH#3 and replacing MH#2 is to install a Cured-In-Place Pipe (CIPP, see Option B) for the sewer line connecting the existing manholes. After the CIPP is installed, it will be extended and connected to the PVC stub out at MH#3A. In this alternative, MH#2 will remain and be rehabilitated. *Please note that if CIPP is utilized between MH#2 and MH#3, the new sewer lines and manhole inverts will need to be adjusted from those shown in the attached Exhibit SK-4.*

This option will require close coordination and planning between the utility contractor, the district, and the design engineer, as well as notification of service disruption to existing customers.

#### **Option B – Cured-In-Place Pipe (CIPP)**

CIPP, or structural pipe lining, is one of several trenchless rehabilitation methods that can be used to repair existing sewers. CIPP is a jointless, seamless, pipe-within-a-pipe repair with the capability to rehabilitate sewers ranging from 2" up to 110" in diameter. CIPP involves using a special two-part epoxy resin and an absorbent tube, made of felt, fiberglass, or other material, to create a new pipe within an existing damaged pipe.

The process involves inserting an epoxy-impregnated liner into the damaged pipe (host pipe) and then inflating it. The liner is then left to cure ambiently, or the curing can be accelerated with steam or UV lighting systems. CIPP is minimally disruptive since there is no trenching or digging. Most repairs can be made without the need to create any additional access pits with the repairs administered through existing cleanouts or manholes. Once the existing lines have been inspected by CCTV and the pipe is found to be in good condition, a minimum of 8-12 hours would be required to rehabilitate the main line and reinstate laterals. To reinstate the existing laterals, a machine utilizing CCTV cuts a hole in the new pipe at the location of the

existing laterals, and a new liner (CIPP) is extended 6'-0" or less into the existing lateral and sealed.

Listed below are the main tasks required for Option B – Cured-In-Place-Pipe Lining (CIPP):

1. Inspect the host pipe and laterals by CCTV.
2. Shut down services discharging into the existing sewer.
3. Clean existing pipes and manholes by hydroblasting.
4. Correct deficiencies in the pipe by grouting or localized replacement if severely damaged.
5. Install CIPP in the main line (multiple sections of pipe can be rehabilitated concurrently).
6. Cure CIPP in the main line by UV or steam to expedite.
7. Rehabilitate existing manholes by spincast application of repair coating.
8. Reinstate laterals with CIPP.
9. Inspect the host pipe and laterals by CCTV.
10. Correct deficiencies in the new pipe if required.

This option will require close coordination and planning between the CIPP installation contractor, the district, and the design engineer, as well as notification of service disruption to existing customers.

### **Option C – Slip Lining**

Slip lining involves either pulling or pushing a new pipe, with an outside dimension smaller than the inside dimension of the host pipe, into the host pipe. Pipe lengths are fused to create a long continuous pipe, frequently done with Polyethylene or fusible PVC, which is then pulled into the host pipe. The space between the new pipe and the host pipe is then filled with grout and the ends are sealed with grout.

The ideal host pipes for slip lining are long straight pipes with no deformities, no or modest bends, no severe protrusions into the pipe, and only modest offset joints. A drawback to slip lining is the reduction of flow capacity of the sewer system due to the loss of space. In addition, slip lining is difficult to install with smaller diameter pipes (<8") and where laterals must be reconnected. Reconnecting the pipes requires excavation at each existing lateral connection.

Compared to slip lining, CIPP technology is more up-to-date and uses technology that was not around when slip lining became popular. CIPP is a flexible process that requires less work than slip lining. Most importantly, the cured pipe with CIPP is much thinner than a slip-lined pipe; thus, closer to the diameter of the original host pipe with little to no reduction in flow capacity.

Based on the information and comparisons made above, the CIPP method is advantageous over slip lining. Slip lining was not considered a feasible trenchless repair method in this study.

#### **Option D – Pipe Bursting**

Pipe bursting involves pulling a new HDPE, fusible PVC, or DIP replacement pipe, the same size or larger than the existing pipe, into the host pipe. A winch pulls a bursting or splitting device through the existing pipe while pulling a replacement pipe in behind the bursting head. The bursting head breaks up the existing pipe pushing it into the surrounding soil and the replacement pipe takes its place.

Disadvantages, as compared to CIPP and slip lining, include pipe bursting causing heaving above the pipe if there is insufficient cover. Other drawbacks to consider include the need to excavate at each existing lateral to make a connection, similar to slip lining.

Based on the information and comparisons made above, the CIPP method is advantageous over both pipe bursting and slip lining. Pipe bursting was not considered an applicable trenchless repair method in this study.

## **CONCLUSIONS AND RECOMMENDATIONS**

The conclusions and recommendations in this report are based on our assessment of existing site conditions, review of reasonable rehabilitation options, the attached drawings in Appendix A, and cost estimates for sewer rehabilitation Option A and B in Appendix B. After careful evaluation, LEC recommends Option B - Cured-In-Place Pipe (CIPP) as the most economical and viable rehabilitation option for the existing sewer at the Captain John Fripp Villas.

## **APPENDIX A**

**SK-1 Existing Layout**

**SK-2 Existing Profiles**

**SK-3 Option A – Offline Sewer Replacement Layout**

**SK-4 Option A – Offline Sewer Replacement Profiles**

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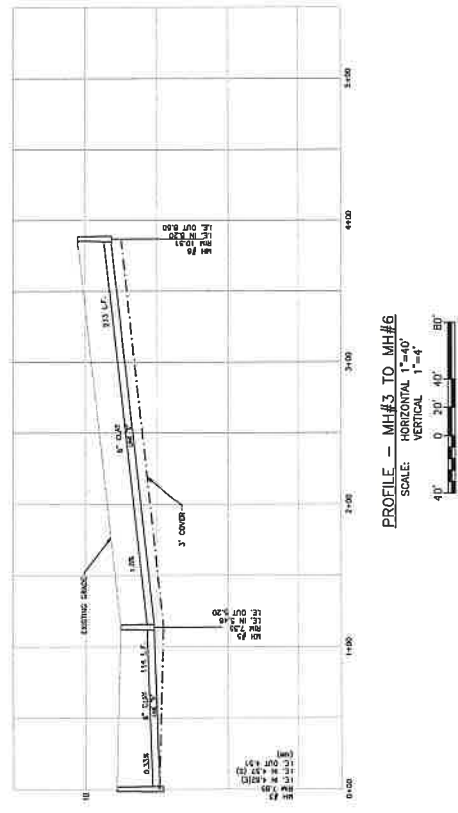
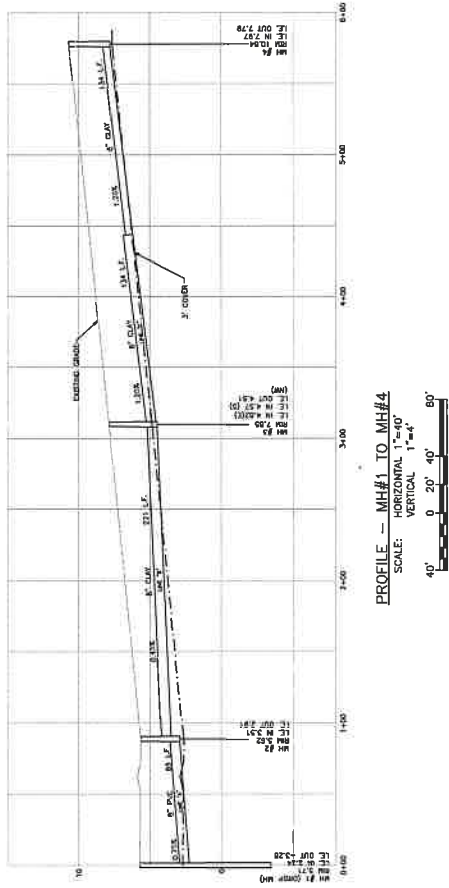
SEWER REHABILITATION STUDY

FRIPP ISLAND PUBLIC SERVICE DISTRICT  
CAPTAIN JOHN FRIPP VILLAS  
BEAUFORT COUNTY, SOUTH CAROLINA

DATE	OCTOBER 2023
DESIGNED	J.P.M.
DRAWN	J.P.M.
CHECKED	J.P.M.
IN CHARGE	J.P.M.

NOT FOR CONSTRUCTION

SHEET NO. SK-2





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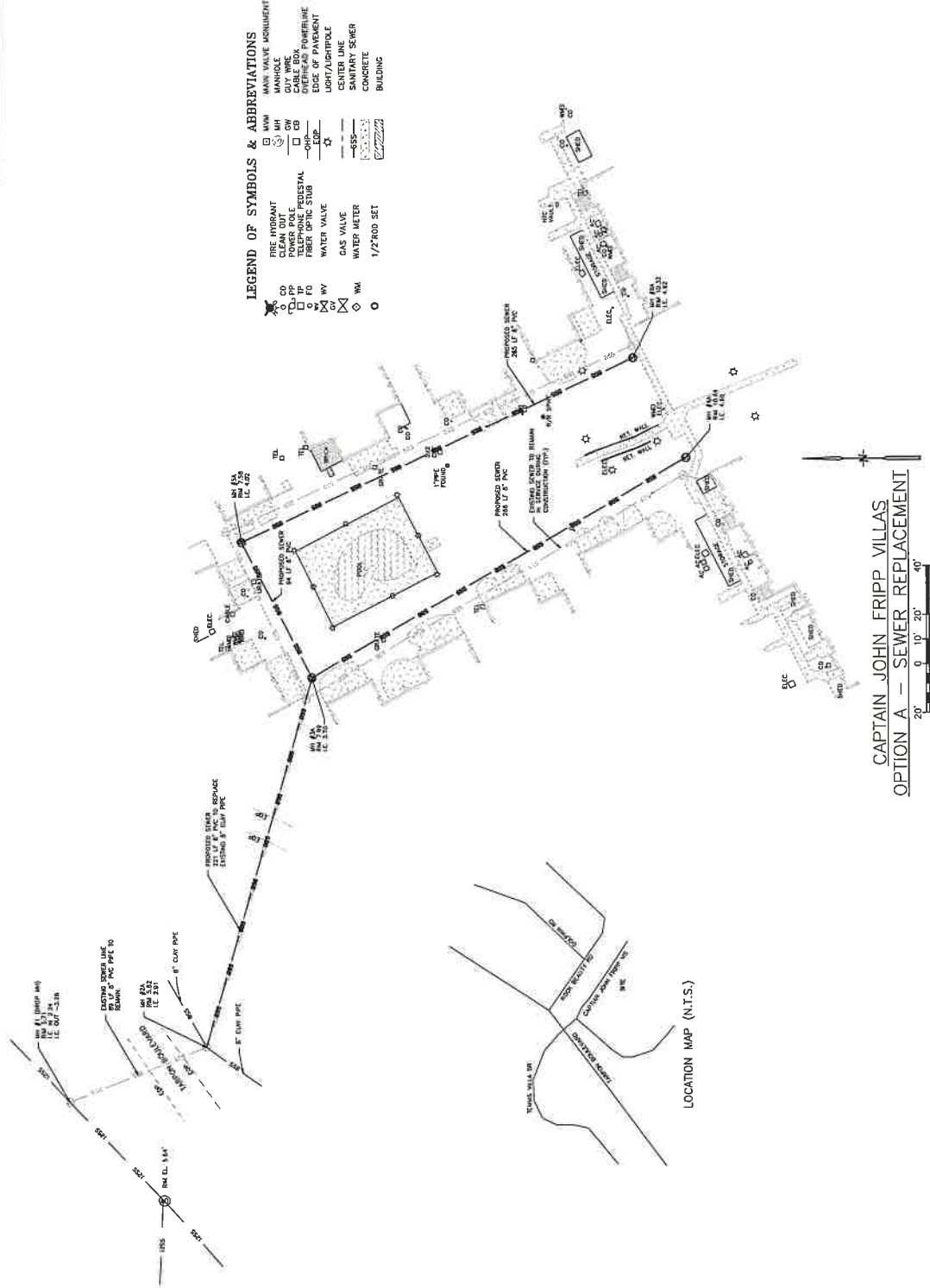
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SEWER REHABILITATION STUDY  
OPTION A - SEWER REPLACEMENT  
LAYOUT

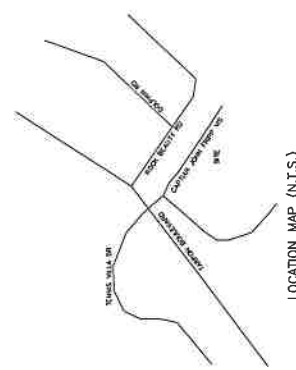
FRIPP ISLAND PUBLIC SERVICE DISTRICT  
CAPTAIN JOHN FRIPP VILLAS  
BEAUFORT COUNTY, SOUTH CAROLINA

SK-3

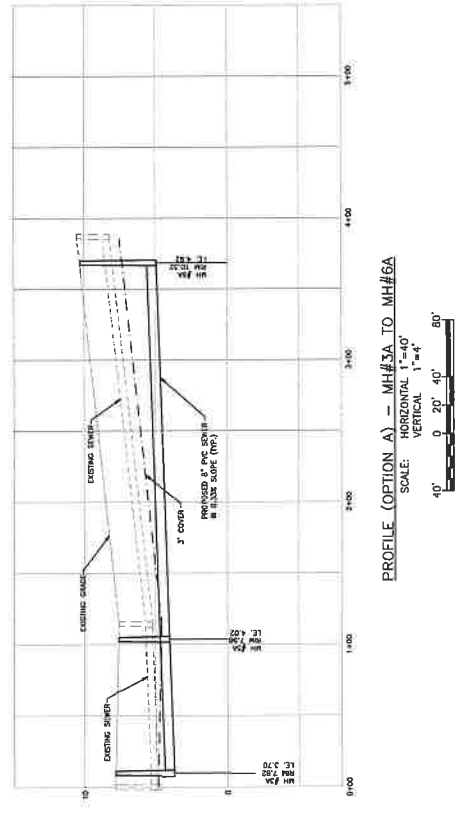
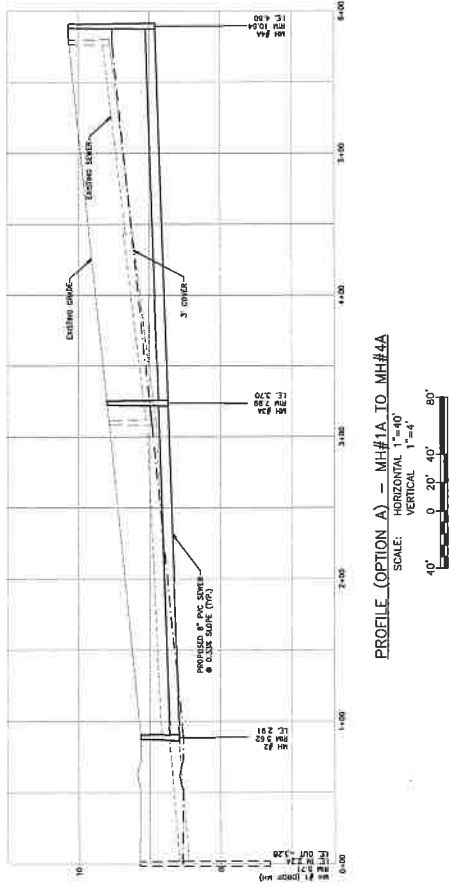


NOT FOR CONSTRUCTION

CAPTAIN JOHN FRIPP VILLAS  
OPTION A - SEWER REPLACEMENT



DRAFT



SEN	REVISIONS	DATE	BY
	DESCRIPTION		



SEWER REHABILITATION STUDY  
OPTION A - SEWER REPLACEMENT  
PROFILES

FRIPP ISLAND PUBLIC SERVICE DISTRICT  
CAPTAIN JOHN FRIPP VILLAS  
BEAUFORT COUNTY, SOUTH CAROLINA

NO	000001	3/23
NO	000002	3/23
NO	000003	3/23
NO	000004	3/23
NO	000005	3/23

NOT FOR CONSTRUCTION

SK-4

## **APPENDIX B**

**Cost Estimate: Option A – Offline Sewer Replacement**

**Cost Estimate: Option B – Cured-In-Place-Pipe Lining (CIPP)**

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**LOWCOUNTRY ENGINEERING CONSULTANTS, LLC**

## BEAUFORT, SOUTH CAROLINA

**PRELIMINARY CONSTRUCTION COST ESTIMATE  
FRIPP ISLAND PUBLIC SERVICE DISTRICT  
CAPTAIN JOHN FRIPP VILLAS - SEWER REHABILITATION STUDY  
OPTION A - OFFLINE SEWER REPLACEMENT**

**October 9, 2022**

	Item Description	Quantity	Unit	Unit Cost	Extended Price
	Mobilization	1	EA	\$15,000.00	\$15,000.00
	8" PVC Sewer	860	LF	\$70.00	\$60,200.00
	Precast Manhole	5	EA	\$4,500.00	\$22,500.00
	Bypass Pumping MH #3A to MH#2A	1	LS	\$5,000.00	\$5,000.00
	Bypass Pumping MH #2 to MH#1	1	LS	\$5,000.00	\$5,000.00
	Demolish Existing Manholes	5	EA	\$1,500.00	\$7,500.00
	Demolish Clay Pipe b/w MH#3 and MH#2	220	LF	\$15.00	\$3,300.00
	Relocate Existing Services to New Sewer	25	EA	\$1,500.00	\$37,500.00
	Cut and Patch Concrete Patio	25	EA	\$200.00	\$5,000.00
	Sod	2500	SF	\$2.00	\$5,000.00
			<b>Construction Total</b>		<b>\$166,000.00</b>
	<b>Engineering (10% of Construction Total)</b>				<b>\$ 16,600.00</b>
	<b>Contingency (20% of Construction Total)</b>				<b>\$ 33,200.00</b>
				<b>Grand Total</b>	<b>\$215,800.00</b>

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# LOWCOUNTRY ENGINEERING CONSULTANTS, LLC

BEAUFORT, SOUTH CAROLINA

## PRELIMINARY CONSTRUCTION COST ESTIMATE FRIPP ISLAND PUBLIC SERVICE DISTRICT CAPTAIN JOHN FRIPP VILLAS - SEWER REHABILITATION STUDY OPTION B - CIPP (CURED-IN-PLACE PIPE)

October 9, 2022

	Item Description	Quantity	Unit	Unit Cost	Extended Price
	Mobilization	1	EA	\$15,000.00	\$15,000.00
	CCTV Inspection Pre-Construction	880	LF	\$3.00	\$2,640.00
	CCTV Inspection Pre-Construction Laterals	25	EA	\$150.00	\$3,750.00
	Hydroblast Cleaning Main Line	880	LF	\$10.00	\$8,800.00
	Hydroblast Cleaning Laterals	250	LF	\$15.00	\$3,750.00
	Pipe Repairs Prior to CIPP	1	LS	\$2,000.00	\$2,000.00
	Clean Existing Manholes	5	EA	\$500.00	\$2,500.00
	Cementitious Lining of Manholes	5	EA	\$3,000.00	\$15,000.00
	Cured-In-Place Pipe Laterals	150	LF	\$15.00	\$2,250.00
	Cured-In-Place Pipe Main Line	880	LF	\$30.00	\$26,400.00
	Reinstate Services	25	EA	\$200.00	\$5,000.00
	CCTV Inspection Post Construction	880	LF	\$3.00	\$2,640.00
				<b>Construction Total</b>	<b>\$89,730.00</b>
				<b>Engineering (10% of Construction Total)</b>	<b>\$ 8,973.00</b>
				<b>Contingency (20% of Construction Total)</b>	<b>\$ 17,946.00</b>
				<b>Grand Total</b>	<b>\$116,649.00</b>

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