

FRIPP ISLAND PUBLIC SERVICE DISTRICT

Tuesday, July 12, 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 June Commission Meeting Minutes
4. Reports
  - Manager's Report for June 2022
    - *March 31, 2022 Unaudited Financial Statements*
  - Fire Department Report for June 2022
  - Report on POA Shoreline Committee Activities – Commissioner Wetzel
5. Old Business
  - 2022 Fripp Inlet Bridge Inspection – *Thai Trinh, JMT, Inc.*
6. New Business
  - JMT, Inc. Proposal for Re-Evaluation of Fripp Inlet Bridge Replacement Cost Estimate
  - FIPSD Water Conservation and Drought Response Regulation
  - Grant Funding Opportunities – SCIP & ARPA
  - Wastewater Capacity on Fripp Island
7. Questions and Comments from Visitors
  - FIPOA Representative
8. Executive Session
  - Legal and Contractual Matters Related to Funding Options for Capital Planning
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 July 12, 2022

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

**Absent:** Dennis Perrone

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

**Guests:** Thai Trinh (JMT Inc.), Tony O'Rourke (FIPOA) John Derrick, Dennis Kautz, J. Newman, Jeanne Sargent, John Marshall, Mike Murphy, Gary Nizzi

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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 June 2022 regular Commission meeting, upon a motion by Mr. Wetzel (Vote: 4:0, 1 abstention).
4. Reports
  - a) The Commission reviewed the Manager's Report for June 2022 and the March 31, 2022 unaudited financial statements. (*Att A*)
  - b) The Commission reviewed the Fire Department Report for June 2022. (*Att B*)
  - c) The Commission received a report on POA Shoreline Committee Activities from Commissioner Wetzel.
5. Old Business
  - a) The Commission entertained Thai Trinh (JMT, Inc.), who presented the draft report of the 2022 Fripp Inlet Bridge inspection. (*Att C*)
6. New Business
  - a) The Commission approved a proposal from Johnson, Mirmiran and Thompson in the amount of \$11,398.00 for re-evaluation of the Fripp Inlet Bridge replacement cost estimate, upon a motion by Mr. Wetzel (Vote: unanimous). (*Att D*)
  - b) The Commission reviewed and discussed the FIPSD water conservation and drought response regulation.
  - c) The Commission reviewed and discussed grant funding opportunities through the SC Infrastructure Improvement Program and the American Rescue Plan Act and directed the District Manager to solicit a proposal from JMT, Inc. for assistance with preparation of a grant application to cover the anticipated costs of recommended repairs to the Fripp Inlet Bridge.
  - d) The Commission discussed wastewater capacity on Fripp Island.
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 at 11:23 a.m., upon a motion by Mr. Keup (Vote: unanimous). The Commission resumed open session at 12:08 p.m., upon a motion by Mr. Keup (Vote: unanimous).

9. There being no further business, the meeting adjourned at 12:09 p.m., upon a motion by Mr. Wetzel (Vote: unanimous).



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Michael J. Wilt  
Chairman



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Angel L. Hughes  
Secretary

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

## **I. Tap-Ins**

<u>Category</u>	<u>FY 2022</u>		<u>FY 2021</u>		<u>FY 2020</u>	
	<u>June</u>	<u>YTD</u>	<u>June</u>	<u>YTD</u>	<u>June</u>	<u>YTD</u>
Water customers	-	30	6	24	3	7
Sewer customers						
a. Gravity	-	20	-	9	2	5
b. Vacuum	-	8	6	14	1	2

Total vacuum sewer customers: 587 of 726

## **II. Routine Operations**

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

	<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	11.0	(0.2)	11.2	0.5	10.7	2.7	8.0
Hunting Isl Pumps Hrs/Day	22.1	(0.4)	22.5	1.2	21.3	7.2	14.1
Total Hrs/Day	33.1	(0.6)	33.7	1.7	32.0	9.9	22.1

### **2. Fripp Island Master Metered Water Use for June, 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	829,286	(1.8)	844,848	0.6	839,688	12.6	746,000
Harbor Island	114,571	(2.6)	117,645	7.9	109,041	(2.3)	111,664
Hunt Island	14,643	(14.2)	17,061	(70.9)	58,616	332.1	13,564
Frapp Island	676,107	(3.8)	703,030	7.4	654,313	27.6	512,750
Accountability,%	97.1	N/A	99.2	N/A	97.9	N/A	98.9
Rainfall, Inches	2.8		2.9		5.7		12.9

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

	<u>Annual</u>	<u>Qtr 2</u>	<u>Qtr 1</u>	<u>Qtr 4</u>	<u>Qtr 3</u>
	<u>Total</u>	<u>2022</u>	<u>2022</u>	<u>2021</u>	<u>2021</u>
Frapp Master Meter	167,428	48,428	26,671	33,108	59,221
Billed Water	152,053	44,995	22,255	31,283	53,521
Total Unbilled Water	15,375	3,433	4,416	1,825	5,700
Unbilled Water Percent	9%	7%	17%	6%	10%
Flushing/Unbilled Accts	2,969	560	1,250	490	668
Unaccounted for Water	12,406	2,873	3,166	1,335	5,032
Unaccounted for Percent	7%	6%	12%	4%	8%

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

### **5. Wastewater Treatment Plant Flow for June, 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	312,033	(7.1)	335,997	(6.2)	358,159	(8.2)	389,963
Weekly Max Flow	328,000	(8.6)	359,000	(6.8)	385,000	(20.5)	484,000
Peak Daily Flow	353,652	(8.3)	385,746	(8.1)	419,953	(44.4)	755,054

Peak daily flow of 353,652 occurred on Thurs., 6/30/22, with 1.2" of rain. For June 2021, peak daily flow occurred on Sat., 6/26/21, without rain. For June 2020, peak daily flow occurred on Wed.,

6/24/20, without rain. For June 2019, peak daily flow occurred on Thurs., 6/13/19, with 2.3” of rain that day and 3.3” of rain the prior day, and at least 3 homeowners removed their sewer cleanout caps, allowing floodwater to drain into the sewer system.

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

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

#### 1. Water System

- a) June 8 – water turned off to Sun Suites at management company request for plumbing repair.
- b) June 15-16 – Field operators performed maintenance on Butchers Island booster pump station: replaced balance line on pump, cleaned rust from floor then treated and painted it.
- c) June 20-23 – Meter reading.
- d) June 22 – Contacts replaced at Butchers Island booster pump station.
- e) June 30 – The SC Drought Response Committee met and upgraded the drought status statewide. Thirteen counties were upgraded from “incipient” (abnormally dry) to “moderate” drought status and the remaining counties were upgraded from “normal” to “incipient”. The Committee will meet to review the status again in mid-July. Conservation measures will be implemented as governed by the District’s Drought Response Regulation.

#### 2. Wastewater System

- a) June 8 & 21-24 – Sludge hauling from wastewater treatment plant.
- b) June 10 – Grinder station on Sea Bass Road faulted. Operators reset breaker, pumped down station and cleaned it.
- c) June 29 – Harbor Island effluent diverted for treatment – turbidity exceeded 5 NTU.
- d) A study exploring replacement/rehab options for the terra cotta sewer lines at Captain John Fripp Villas is ongoing. The engineer is waiting on surveyor drawings.

#### 3. Administrative & Personnel Activities

- a) Cybersecurity & IT Support – The final step in implementation of the security measures recommended by Cyber Risk Analysis Group is the migration of accounting software to the cloud and retirement of the old Windows 7 server. Management is exploring updated software solutions that will streamline operations and provide better client support.
- b) Long-time field operator Charlie Johnson will officially retire on July 11<sup>th</sup> – last working day was June 24<sup>th</sup>.
- c) The District auctioned the 1989 fire truck and a 2015 Chevrolet Silverado on June 30<sup>th</sup> for \$3,951 and \$7,800, respectively.

#### 4. Hunting Island Booster Pump Station Rehab – Site work was completed during June and the slab scheduled for pouring during the first week in July. The contractor’s schedule is as follows:

Site Work	May 30 – June 10
Construction (with overnight shutdowns)	June 10 – August 26
Project Close-out	August 29 – September 9

- 5. Seaglass Development – Still in the design phase. The wastewater treatment facility was designed to include capacity for this development, but upgrades to the collection system may be necessary and the developer has been provided with this information.
- 6. Election of Commissioners – Two Commission seats will be up for election in the November 2022 general election. One individual has submitted a Statement of Candidacy. The deadline for filing with the Beaufort County Board of Elections is August 15, 2022 at noon.

**FRIPP ISLAND PUBLIC SERVICE DISTRICT**

July 1, 2022 through March 31, 2022

Statement of Revenues & Expenses

Water & Wastewater Operations

	Actual	Budget	Variance Favorable (Unfavorable)	Variance Comments
Operating revenues				
Water operations	794,372	749,777	44,595	Sewer usage, new taps, misc inc.
Water Tank Leases	220,398	220,395	3	
Wastewater operations	593,861	560,341	33,520	Sewer usage, new taps, misc inc.
Total operating revenues	1,608,631	1,530,513	78,118	
Cost of sales	(363,069)	(376,509)	13,440	
Gross profit from operations	1,245,562	1,154,004	91,558	
Operating expenses				
General & administrative	470,544	566,483	95,939	Salaries, insurance & professional
Water system expenses	58,205	64,630	6,425	water line & meter repairs
Wastewater expenses	205,271	284,223	78,952	wwtp, force mains
Total operating expenses	734,020	915,336	181,316	
Earnings (loss) from operations	511,542	238,668	272,874	
Nonoperating income (expenses)				
Interest earned	48,852	47,063	1,789	
Taxes & assessments collected	813,761	806,470	7,291	Timing of VSS collections
Capital & Unrealized Inv Gain (Loss)	(218,151)	-	(218,151)	unrealized investment losses
Interfund Transfers (Out)	(2,606)	-	(2,606)	reallocated surplus to FD-appr fy21
Bond interest & expenses	(99,859)	(101,085)	1,226	
Net nonoperating income (expenses)	541,997	752,448	(210,451)	
Earnings (loss) before depreciation	1,053,539	991,116	62,423	
Depreciation/Loss on disposal	446,946	455,753	8,807	
Net earnings (loss)	606,593	535,363	71,230	
Cash available on July 1, 2021			7,053,906	
Earnings (loss) before depreciation & debt amortization			1,053,539	
Changes in assets & liabilities				
(Increase) decrease in accounts receivable			141,812	
(Increase) decrease in inventory			(8,701)	
(Increase) decrease in prepaid expenses			(14,396)	
(Decrease) increase in accounts payable & transfers			(102,453)	
(Decrease) increase unrealized gains			-	
Net cash provided (used)			16,263	
Cash flow from capital & financing activities				
Asset additions/deletions & construction in progress			(112,095)	
Principal payments on bonds & deferred debt			(697,874)	GO bonds (WWTP & WL) & Rev bond
Bond proceeds & contributed capital			-	
Net cash provided (used)			(809,969)	
Cash available on March 31, 2022			7,313,738	
Available cash includes following balance sheet accounts:	Beginning	Ending	Change Pos. (Neg.)	
Cash (gross revenue, petty cash & contingency fund)	3,055,582	3,407,299	351,717	
Due from Beaufort County Treasurer (Vac sewer assessments)	374,195	367,886	(6,309)	
Investments & restricted cash (Sewer const fund, DS, invest.)	3,624,129	3,538,552	(85,577)	
Total	7,053,906	7,313,737	259,831	

**FRIPP ISLAND PUBLIC SERVICE DISTRICT**

July 1, 2021 through March 31, 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	568,907	546,600	22,307	196,769	190,400	6,369
Assessments, donations & FIPOA	8,000	2,400	5,600	-	-	-
Utility attachment fees	-	-	-	18,576	18,570	-
*Interest, cap gain (loss) & miscellaneous	2,990	-	2,990	(6,722)	2,880	(9,602)
<b>Total Revenues</b>	<b>579,897</b>	<b>549,000</b>	<b>30,897</b>	<b>208,623</b>	<b>211,850</b>	<b>(3,233)</b>
<b>Expenditures</b>						
Employee expenses	359,882	398,228	38,346	-	-	-
General & Administrative	79,427	63,458	(15,969)	129,424	130,295	871
Operations	15,308	25,013	9,705	1,381	58,700	57,319
<b>Total Operating Expenses</b>	<b>454,617</b>	<b>486,699</b>	<b>32,082</b>	<b>130,805</b>	<b>188,995</b>	<b>58,190</b>
Bond Interest & expenses	-	-	-	-	-	-
Capital outlay	2,205	11,000	8,795	-	-	-
<b>Total Expenditures</b>	<b>456,822</b>	<b>497,699</b>	<b>40,877</b>	<b>130,805</b>	<b>188,995</b>	<b>58,190</b>
<b>Revenues over (under) expenditures</b>	<b>123,075</b>	<b>51,301</b>	<b>71,774</b>	<b>77,818</b>	<b>22,855</b>	<b>54,963</b>
 Cash available July 1, 2021	 658,535	 471,756	 186,779	 730,932	 724,720	 6,212
Revenues over (under) expenditures	123,075	51,301	71,774	77,818	22,855	54,963
Increase (decrease) payables & transfers	(186,292)	-	(186,292)	(442)	(3,630)	3,188
<b>Cash available March 31, 2022</b>	<b>595,318</b>	<b>523,057</b>	<b>72,261</b>	<b>808,308</b>	<b>743,945</b>	<b>64,363</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 March 31, 2022</b>	<b>263,980</b>	<b>92,497</b>	<b>356,477</b>

**FRIPP ISLAND PUBLIC SERVICE DISTRICT**

July 1, 2021 through March 31, 2022

Statement of Revenues & Expenses

Debt Service Fund

	Actual	Budget	Variance Favorable (Unfavorable)	Comments
<b>Revenues</b>				
Tax levies-wwtp, waterline, bridge, revetment	792,026	774,720	17,306	timing
Service assessments	-	-	-	
Interest, penalties & misc	3,696	-	3,696	pen & interest
<b>Total Revenues</b>	<u>795,722</u>	<u>774,720</u>	<u>21,002</u>	
<b>Expenditures</b>				
Interfund Transfers (wwtp & wtrline GO bond P&I)	457,795	457,830	35	
Governmental bonds (revtmt & bridge P&I)	223,736	223,760	24	
Bond payment fees	-	-	-	
<b>Total Expenditures</b>	<u>681,532</u>	<u>681,590</u>	<u>58</u>	
<b>Revenues over (under) expenditures</b>	<u>114,190</u>	<u>93,130</u>	<u>21,060</u>	
 Cash available July 1, 2021	409,194	392,000	17,194	
Revenues over (under) expenditures	114,190	93,130	21,060	
Increase (decrease) payables & transfers	-	-	-	
<b>Cash available March 31, 2022</b>	<u>523,384</u>	<u>485,130</u>	<u>38,254</u>	pen & interest

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, 2021 needs to be sufficient to cover Sept. 1, 2021 revetment biannual debt payment of \$7,780, Oct 1 & Dec 1, 2021 wwtp & wl quarterly debt payments totalling \$305,220, and Oct. 1, 2021 bridge biannual debt payment of \$40,100 (Grand Total - \$353,100)



**FRIPP ISLAND PUBLIC SERVICE DISTRICT**

Combined Balance Sheet

All Fund Types and Account Groups

March 31, 2022

	Proprietary Fund Type	Governmental Fund Types					Totals
		Erosion & Bridge	Fire Dept.	Debt Service	Capital Projects	March 2022	
<b>ASSETS</b>							
Available Cash	3,407,299	56,178	50,099			3,513,576	
Due from Beaufort County Treasurer	367,886	635,603	545,219	523,384		2,072,092	
Accounts receivable water & sewer system	328,042					328,042	
Accounts receivable-other	7,674					7,674	
Interfund receivable / transfer accounts						-	
Inventory	31,450					31,450	
Prepaid expenses	50,136					50,136	
Restricted cash, debt service funds & investments	3,538,552				356,477	4,011,557	
Fixed assets (net of accumulated depreciation)	12,910,810	116,528				12,910,810	
Unamortized debt acquisition costs	-					-	
Deferred Outflows-Pension & OPEB	190,339					190,339	
Amount provided for retirement of long term debt	-					-	
Total Assets	20,832,187	808,308	595,319	523,384	356,477	23,115,674	
<b>LIABILITIES</b>							
Vouchers & accounts payable	51,931	275	7,753			59,960	
Accrued employee expenses	13,742					13,742	
Payable from restricted assets (accrued bond int.)	39,228					39,228	
Deferred revenue & receivable clearing accounts	(27,917)					(27,917)	
General obligation & revenue bonds payable	6,643,193					6,643,193	
Pension & OPEB liability & deferred inflows	1,247,947					1,247,947	
Interfund payable / transfer accounts	4,170	(570)	(3,900)			(300)	
Total liabilities	7,972,295	(295)	3,853	-		7,975,853	
<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)	606,592	77,818	123,075	114,190	(3,703)	917,972	
Total fund equity	12,859,892	808,603	591,465	523,384	356,477	15,139,821	
<b>∞</b>	20,832,187	808,308	595,319	523,384	356,477	23,115,673	

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

## **Response Activities:**

Total emergency responses for June, 46

	June 2022	June 2021	YTD CY22	YTD CY21
• Structure Fires	01	00	01	00
• Vehicle Fire	00	00	00	00
• Medical Emergencies	25	19	77	55
• Brush Fires	00	00	00	00
• Misc. Fire	06	09	16	23
• Service Calls	04	08	12	16
• Mutual Aid	02	01	04	02
• Auto Accident	02	01	05	09
• Water Emergencies	06	01	07	01
	-----	-----	-----	-----
	46	39	122	106

## **Average emergency response time:**

5 minutes 22 seconds.

## **Inspections:**

June 2022	June 2021	YTD CY22	YTD CY21
0	0	0	0

## **Training Activities:**

No training for June .

## **Roster:**

Total personnel active for June, 21

Vol.-01

Paid-20



# DRAFT

## TECHNICAL REPORT

# FRIPP INLET BRIDGE

## 2022 ABOVE AND WATER INSPECTION & HYDROGRAPIC SURVEY

JMT Project # 13-1394-016

### Prepared by:

JMT

235 Magrath Darby Boulevard, Suite 275

Mt. Pleasant, South Carolina 29464

### Submitted to:

Fripp Island Public Service District

Inspection Date: February 6-10, 2022

Report Date: May 16, 2022

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**Appendix A:** Bridge Drawings and Inspection Notes

**Appendix B:** Bridge Soundings

**Appendix C:** Photographs

**Appendix D:** GEL Engineering Hydrographic Survey

**Appendix E:** National Bridge Inspection Standard Recording and Coding Guide

## **1.0 INTRODUCTION**

### **1.1 Purpose and Scope**

The scope of the project included a National Bridge Inspection Standards (NBIS) based above water bridge inspection of the structure and a hydrographic survey of Fripp Inlet in Beaufort County, South Carolina. From February 6-10, 2022, Johnson, Mirmiran and Thompson (JMT) performed an inspection of the structural elements associated with the bridge, both above and below water. From February 4-6, 2022 GEL Engineering, LLC performed a hydrographic survey of the Fripp Inlet extending 600 ft upstream and downstream of the bridge.

This report includes a significant findings summary, description of the structure, method of investigation, existing site conditions, evaluation and structural assessment with recommendations, as well as detailed drawings indicating the location of any observed defects and notable conditions.

### **1.2 General Description of the Structure**

The Fripp Inlet Bridge is a 1,990 foot long bridge consisting of forty-nine simple Spans which carry one northbound and one southbound lane of traffic on Tarpon Boulevard over The Fripp Inlet in Beaufort County, South Carolina. The bridge span arrangement consists of one 70 foot long navigation span and forty-eight 40 foot long approach spans. The superstructure consists of a reinforced concrete deck supported by AASHTO Type IV Prestressed Concrete Beams at the navigation Span and by AASHTO Type II Prestressed Concrete Beams at all other Spans. The substructure consists of fifty pile Bents supported by prestressed concrete piles.

The original structure built in 1963 consists of three different Bent types, all of which consist of 21 in. octagonal prestressed concrete piles. Bent Type I has 4 prestressed concrete piles, (Bents No.1-4,6-8,10-12,14-16,18-20,22-24,27-29,31-33,35-37,39-41,43-45,47-50 refer to Photograph 35) for a total of 38 Bents. Bent Type II has 6 prestressed concrete piles, (Bents No. 5,9,13,17,21,30,34,38,42,46 refer to Photograph 36) for a total of 10 Bents. Bent Type III has 8 prestressed concrete piles, (Bents No. 25 and 26 refer to Photograph 37) for a total of 2 Bents. Refer to Figures in Appendix A for the Bent configurations.

Based on plans provided by Fripp Island Public Service District (PSD) and the Property Owners Association (POA), four separate retrofits have been added to the bridge since the original construction.

The first retrofit in 1980, added new larger pile caps located below the 1963 pile caps and four composite 20 in. square prestressed concrete piles with a steel section of HP 12x74 to Bents 6 through 13. Based on the 1980 plans, the tip of the concrete portion was driven 5 ft to 10 ft below the original channel bottom. The tip of the steel section was determined

based on a test pile driven at Bent 7. The results of the test pile were unavailable, however the repair plans from 1996 indicated that the pile tips were at elevation -88. This was the only available record of the pile tip elevations for the 1980 repairs.

The 1996 retrofit expanded on the 1980 repairs by adding one battered 20 in. square prestressed concrete pile to the west side of Bents 6 through 13. The 1996 retrofit also added a new pile cap and six additional prestressed concrete piles to Bents 5 and 14 through 16. The plans did not show any repairs to Bent 17; however, the same retrofit was constructed at Bent 17.

The 1999 retrofit added rip rap to Bents 1 and 50, repaired spalls throughout the structure, and added a larger pile cap which encompasses the original pile cap and sits directly above and tied into the retrofit pile caps from the 1980 and 1996 repairs on Bents 6 through 13. One battered 20 in. square prestressed concrete pile was installed on the east side of Bents 5 through 17. Refer to Photograph 38 and 39 for an overall view of the retrofit pile caps.

The 2019 retrofit added new larger pile caps located below the 1963 pile caps at 12 bents. The new retrofit bents have six 20 in. battered square prestressed concrete piles added to Bents 4 and 18, and six 20 in. battered square prestressed concrete piles with HP 10 x 57 points added to Bents 35-44. The tip of the concrete portion is driven to an elevation of -97 for Bents 4 and 18, and -83 for Bents 35-44 with the steel tip driven to an elevation of -93. Refer to Photograph 40 and 41 for an overall view of the 2019 retrofit pile caps. The retrofit also included concrete spall repairs to prestressed concrete girders, shear keys, bridge railing, and replacement of three deteriorated timber dolphins.

Figure 1 in Appendix A depicts the location of the bridge over Fripp Inlet in Beaufort County, South Carolina.

The labeling convention used in this report to designate the Substructure Units (SSUs) follows that of the original design drawings dated December 1961. The Bents were labeled numerically from south to north, and the piles were labeled alphabetically from west to east. The beams were labeled numerically from west to east. Refer to Figures 2 through 6 in Appendix A for a plan of the bridge, and Figure 10 for an elevation sketch of the bridge.



### 1.3 Method of Investigation

A two-person team led by a South Carolina registered Professional Engineer and National Bridge Inspection Standards (NBIS) qualified bridge inspection team leader, conducted the on-site above water inspection. The underwater inspection was conducted by a four-person team led by a South Carolina registered Professional Engineer. The inspection team performed a visual and tactile inspection of all accessible bridge components. The underside of bridge inspection was performed from a “snooper” truck and a 20-foot Carolina Skiff.



Photo 1.3-1: Dive Boat

A hydrographic survey was performed by GEL Engineering to determine channel bottom elevations across the inlet and extending 600 ft upstream and downstream of the structure.

See Appendix A for a complete list of observed defects.

## 2.0 EXISTING SITE CONDITIONS

### 2.1 Traffic Safety Features (Item 36)

**NBIS Rating: 0000**

#### (A) Bridge Railings

**NBIS Rating: 0**

**Description:** Reinforced concrete railing.

**General Condition:** Reinforced concrete bridge railings are located along the east and west fascia of the bridge. The railings are in good condition with previously identified defects appearing to be stable. Typical defects include exposed shallow reinforcing on the vertical posts and spalls. Refer to Photographs 20 and 21.

#### (B) Transitions

**NBIS Rating: 0**

**Description:** No Guardrail transition installed.

**General Condition:** N/A

**(C) Approach Guardrail**

**NBIS Rating: 0**

**Description:** No Approach Guardrail installed.

**General Condition:** N/A

**(D) Approach Guardrail Ends**

**NBIS Rating: 0**

**Description:** No Approach Guardrail Ends installed.

**General Condition:** N/A

**2.2 Bridge Deck (Item 58)**

**NBIS Rating: 6 (Satisfactory Condition)**

**(A) Deck**

**Description:** The deck consists of a reinforced concrete slab.

**General Condition:** The bridge deck is in satisfactory condition. Transverse top of deck cracks ranging from hairline to 1/16 in. wide and 6 ft to 10 ft long were observed at random isolated spans along the bridge (Photograph 12). Minor hairline map cracks were observed throughout the top of deck covering 10% to 20% of the deck area. Isolated minor spalls, transverse cracks, impending spalls, and exposed shallow reinforcement were located on the underside of the deck (Photograph 23) and at the curb faces (Photograph 15).

**(B) Drains and Scuppers**

**Description:** Each 40 ft span has 3 scuppers on the east and west side, the 70 ft span does not have scuppers.

**General Condition:** Scuppers are in satisfactory condition and clear of debris. The drainage inlets for the scuppers exhibit minor shallow spalls with exposed reinforcement at several locations throughout the top of deck. Numerous scuppers throughout the bridge exhibit corrosion holes up to 4 inches in diameter which allow runoff water to drain onto the exterior beams below the deck. Since FIPSD does not use road salts, the holes in the scuppers do not currently warrant repairs.



### **(C) Light Standards**

**Description:** Bridge has concrete pedestals for future light poles on the west side.

**General Condition:** Concrete pedestals are in good condition.

### **(D) Utilities**

**Description:** Utilities are located under the east sidewalk, along the west fascia and under the deck between beams 3 and 4.

**General Condition:** Utilities are in satisfactory condition and are located along the west fascia of the bridge and suspended from diaphragms between Beams 3 and 4 under the bridge deck (Photograph 25). Two PVC and two ductile iron pipes were suspended below the sidewalk along the east fascia of the bridge (Photograph 16). The PVC conduit in Span 12 was unattached near mid span and sagged below the bridge, and in Spans 22 and 27 the PVC was disconnected (Photographs 17 and 18). The ductile iron pipe exhibits light corrosion throughout the length of the bridge. No visible signs of water leakage were found at the pipe joints. The utility hanger inserts attached to the underside of the deck for the smaller, inboard ductile iron pipe exhibits moderate corrosion.

### **(E) Joints**

**Description:** Compression seals are located between all spans, typically sized between 1 ½ in. to 2 in.

**General Condition:** Compression seals in satisfactory condition. All the joints located between each simple span had compression seals with light debris throughout and moderate to heavy debris near the curb lines. The joints generally range from 7/8 in. to 2 3/8 in. wide.

### **(F) Centerline Reflectors and Raised Pavement Markers**

**Description:** 4 in. by 4 in. two-way square yellow plastic square reflectors located down the center of the bridge.

**General Condition:** Approximately forty percent of the centerline reflectors or raised pavement markers are missing along the length of the bridge. These reflectors are used as a supplement to the yellow stripes which are in good condition. Due to the straight alignment, low volume, and low speed limit, it is not recommended to replace the missing centerline reflectors at this time.

## 2.3 Bridge Superstructure Item 59

**NBIS Rating: 6 (Satisfactory Condition)**

### (A) Structural Members

**Description:** 40 ft spans (Span 1-24 and 26–49) consists of four AASHTO Type II prestressed concrete beams, the 70 ft span (Span 25) consists of four AASHTO Type IV prestressed concrete beams.

**General Condition:** The beams are in satisfactory condition. Shallow reinforcement spalls are present in random isolated areas throughout (Photographs 28 and 29). Beam ends exhibit bottom corner spalling and vertical cracking with associated impending spalls in isolated locations (Photograph 26). Previous concrete spall repairs to the beams exhibited loosed mortar or grout along the edges of the repair, which do not warrant repairs at this time. The beam sole plates exhibited moderate corrosion at most locations throughout the bridge.

### (B) Bearings / Shear Keys

**Description:** Each beam is simply supported by elastomeric bearing pads with one end fixed and the other end expansion.

**General Condition:** Very good condition. The elastomeric bearing pads are in very good condition with no defects noted in the material. Lateral deformation in the elastomer was not seen at any bearing locations. The bearing pad supporting Beam 2 Span 8 at Bent 9 was hanging  $\frac{3}{4}$  in. over the edge of the beam seat. This condition has remained stable for multiple inspection cycles (since 2015). It was not known if the bearing pad was placed incorrectly during construction or if the bearing pad had shifted while in service. The condition should be monitored during future inspections.

### (C) Diaphragms

**Description:** Reinforced concrete end diaphragms are located at Bents 1 and 50. The 40 ft spans had interior diaphragms at the mid-span and over the bents. The 70 ft span had interior diaphragms at  $\frac{1}{3}$  span,  $\frac{2}{3}$  span and over the bents.

**General Condition:** The diaphragms are in satisfactory condition with minor spalls typically due to the electrical utility anchoring system located on the diaphragms between Beams 3 and 4. Spalls with up to 1" penetration and exposed reinforcing bars exist on the faces of the mid-span diaphragms at isolated locations. The bottom of all interior diaphragms in Span 6 exhibited 6" diameter spalling with exposed reinforcement bars that have up to 10% section loss. Repairs are not recommended at this time for these minor deteriorations.

## **2.4 Bridge Substructure (Item 60)**

**NBIS Rating: 5 (Fair Condition)**

### **(A) End Bents (Abutments)**

**Description:** Bents 1 and 50 are supported by four octagonal piles, all piles are buried.

**General Condition:** The end bents are in good condition.

### **(B) Wingwalls**

**Description:** Reinforced concrete wingwalls run perpendicular to the roadway.

**General Condition:** Wingwalls are partially buried, and the visible portions are in good condition. There is a vertical crack in the southwest wingwall as well as a void under the wing wall with fill retained by timber boards that is in good condition. The timber retaining wall for utilities at the southwest corner of the bridge has partially failed, allowing the fill to erode (Photograph 10).

### **(C) Settlement**

**Description:** N/A

**General Condition:** No settlement observed.

### **(D) Pile Caps**

**Description:** The original structure has reinforced concrete pile caps. Bents 4-18 and 35-44 have retrofit caps. See Figure 7 in Appendix A for details.

**General Condition:** The original pile caps and upper retrofit caps are in good condition. The lower retrofit caps Bents 5 through 13 are in poor condition. The pile caps supporting the superstructure do have some horizontal and vertical cracks with rust and efflorescence stains. A few of these locations have spalls/impending spalls with rust stains. Defects noted during previous inspections to pile caps appear to be in stable condition (Photographs 35 thru 44).

### **(E) Pile Collar**

**Description:** Bent 25 has a reinforced concrete pile collar around the north piles. Bent 26 has a reinforced concrete pile collar around the south piles.

**General Condition:** The pile collars are in poor condition. The pile collars at Bents 25 and 26 on either side of the main navigation Span, exhibit cracks, impending spalls, and spalls with rust staining throughout their length (Photographs 52 and 53). Due to limited vertical clearance and shallow waters at

the mouth of Fripp Inlet, heavy marine traffic uses the Harbor River at the north end of Hunting Island. Repairs to the collars are not recommended at this time since there is no significant marine traffic.

#### **(F) Piles**

**Description:** The original structure has 21 in. octagonal prestressed concrete piles. The retrofit piles are 20 in. square prestressed concrete piles. Six 20 in. square prestressed concrete piles and two 21 in. octagonal prestressed concrete piles have been jacketed.

**General Condition:** The piles are typically 95 to 100% covered in marine growth from the tidal zone to the channel bottom. The piles were in fair condition. Defects noted during previous inspections to piles including delamination, vertical cracking and rust staining appear to be in stable condition (Photographs 54 thru 66). Vertical undermining of the original concrete piles occurs at Retrofit Bents 8-11. Retrofit piles at Bents 8-13 have exposed steel H-Piles. The exposed Steel H-Piles at Bents 12 and 13 are significant enough to perform an additional stability analysis.

### **2.5 Channel and Channel Protection (Item 61)**

**NBIS Rating: 7**

#### **(A) Channel**

**Description:** The channel is located in a tidal zone with a water velocity ranging from 0 to 3 ft per second with a tidal fluctuation of approximately seven feet.

**General Condition:** Riprap and embankments are in good condition.

The Fripp Inlet has had previous history of significant scouring of the channel bottom particularly between Bents. 2-20. Past retrofit repairs that have added additional piles and pile caps to address the scour issue. The hydrographic survey indicates that the maximum water depth is 42.75 ft below mean low water at Bents 14-15.

A comparison of the Upstream and the Downstream channel bottom profiles from past hydrographic surveys, and channel bottom soundings, indicate that Fripp Inlet channel appears to be fairly stable with some minor changes when compared to the recent soundings. The Upstream and Downstream profiles do not indicate any significant channel degradation. Refer to Figures 10 and 11 in Appendix B for a comparison of channel bottom profiles between 1961 and 2022. Refer to Bridge Hydrographic Survey Appendix D.

The banks along the Fripp Inlet near the bridge are in stable condition. Embankment protection in the form of riprap and moderate vegetation exists on the north and south

banks. There are no signs of active erosion. Refer to Photograph 68 for a typical view of the embankments.

## **2.6 Bridge Posting (Item 70)**

**NBIS Rating: 1**

**Description:** Bridge is posted to a weight limit of 27 tons gross.

**General Condition:** Bridge limit of 54,000 lb is 67.5% of the 80,000 lb legal limit.

## **2.7 Waterway Adequacy (Item 71)**

**NBIS Rating: 8**

**Description:** The tidally influenced Fripp Island Inlet flows under the structure within the channel limits.

**General Condition:** Bridge deck is above roadway approaches. A hydraulic analysis has not been performed to determine the waterway adequacy.

## **2.8 Approach**

### **(A) Joints / Pavement**

**Description:** An asphalt roadway is located at the beginning and end of the bridge.

**General Condition:** The approach roadway is in good condition. The North and South approaches exhibit minor transverse hairline cracking the full width of the roadway. The North approach has 2 in. of settlement at Bent 50, with up to a 1 in. gap between the approach road and end of bridge, vegetation is growing in the gap. The North approach has an 18" long spall in the west curb.

## **2.9 Miscellaneous**

### **(A) Vertical Clearance**

**Description:** The Bridge carries traffic over the tidally influenced Fripp Island Inlet. The navigational limits of the Fripp Inlet are encompassed between Bent 25 and Bent 26. The minimum vertical clearance over span 25 at the mean high-water elevation is 15.0 ft based on existing plans.

**General Condition:** N/A

### **(B) Waterway Fender System**

**Description:** Each corner of the navigational channel is protected by a seven-pile timber dolphin.

**General Condition:** All four of the timber dolphins are in good condition. The timber dolphins were recently replaced. It is understood that the boat traffic generally consists of small pleasure boats, and not heavy commercial traffic.

### **(C) Traffic Signs**

**Description:** "SPEED LIMIT 25", Electronic "YOUR SPEED \_\_\_\_", "TRUCKS 15", "NO FISHING ON BRIDGE", "BRIDGE SPEED LIMIT 25 MPH CARS 15 MPH TRUCKS".

**General Condition:** The traffic signs are in good condition.



### **3.0 EVALUATION AND STRUCTURAL ASSESSMENT**

Overall, most of the structural components of the bridge were found to be in satisfactory to fair condition with only minor changes to the overall bridge condition in isolated locations. However, there were several structural components with significant enough deterioration to warrant repair. Notably, the bottom flanges of Span 7-Beam 2, Span 7-Beam 3, and the pile cracks found at Bents 9, 11-13, 16, 21, and 23. Additionally, the exposed H-piles at bents 12 and 13 have been exposed an additional few feet.

The bridge deck was found to be in satisfactory condition (Code 6). The hairline cracks, map cracking, minor spalls and exposed reinforcement do not currently affect the structural stability of the bridge.

The superstructure components of the bridge were found to be in satisfactory condition (Code 6) except as noted above. The minor isolated cracks and spalls in the prestressed concrete Beams do not currently affect the structural stability of the bridge.

The substructure components were found to be in fair condition (Code 5). Pre-existing defects were found to be in stable condition compared to previous inspections. Pile cracks found at the above noted Bents are significant enough to warrant repair. The remaining minor cracks, delaminated areas and spalls present on the structurally significant portion of these bents do not currently affect the structural stability of the bridge but should be monitored during future inspections. The numerous defects on the underside of the retrofit caps in Bents 6 through 13 do not currently affect the structural capacity of the bridge.

A comparison of the available channel bottom profiles indicate that the channel bottom is continuing to migrate at the bridge, with some minor aggradation and degradation over the past several years throughout the length of the bridge. The upstream side of Bents 9-20 have scoured an additional 5ft to 8ft since the original hydrographic survey in 2011. The area adjacent to the bridge on the Hunting Island side appears to have some aggradation, as the water is shallower farther out into the inlet, however directly under the bridge, the channel bottom profile is relatively unchanged. This has resulted in a depression under the bridge on the Hunting Island side. These changes to the channel bottom will continue to be monitored during future hydrographic surveys.

In addition to the structural elements discussed above, the inspection team assessed other components such as Traffic Safety Features, Bridge Posting, Waterway Adequacy, and the Approach Roadway. An explanation of the rating system can be found in Appendix E.

## 4.0 RECOMMENDATIONS

The concrete beams utilize prestressing strands in the bottom flange as the main load carrying system. The spalls on the bottom flange of Beam 2 and Beam 3 in Span 7 occurred in the lower bending stress regions near the bearings, therefore the structural capacity of the member should not have been affected. However, repair is still recommended to prevent further damage propagating into the higher stress regions of the beam. This condition could eventually lead to a reduction in structural capacity.

There are new minor deteriorations throughout the top of deck, underside of deck and on few isolated beams. This includes minor spalls or delamination, shallow spalls with exposed reinforcing steel or hairline transverse cracks. These minor deficiencies are common with an in-service bridge of this age. They do not affect the structural capacity and do not currently require repairs. Pre-existing defects have not deteriorated appreciably since the previous inspection in 2019. The new cracks and delaminated areas in the pile caps do not currently warrant repairs, however, repairs to the piles are recommended. Pile repair would consist of removing unsound concrete and replacing with grout filled pile jackets.

The condition of the bridge should be monitored with regularly scheduled inspection cycles. The National Bridge Inspection Standards recommends above water inspection cycles not to exceed two years and every five years for underwater inspections. This helps to track and monitor deficiencies and identify when repairs are warranted.

The overall condition of the channel bottom should be continuously monitored with periodic hydrographic surveys and evaluation of the scour surrounding the bridge. In addition, bridge soundings should be taken as part of the biennial above water inspections, as well as following significant flooding events.

The Fripp Inlet appears to be naturally migrating south, as the south side of Hunting Island has some aggregation and the north side of Fripp Island has additional scour. Due to additional local scour in the vicinity of Bents 12 and 13, JMT recommends an additional analysis on these bents to determine their stability and at what depth of additional scour a repair will be required.



## 5.0 SIGNIFICANT FINDINGS SUMMARY

Table 5-1 below lists the summary of recommended repairs.

**Table 5-1 Recommended Repairs**

Inspection Note No.	Location	Repair Type
88-89	Span 7 Beam 2 and 3	Spall repair
136-150	15 - Prestressed Concrete Piles	Pile Jackets
168-176	Bent 12 and 13	Stability Analysis

Respectfully submitted,

JMT



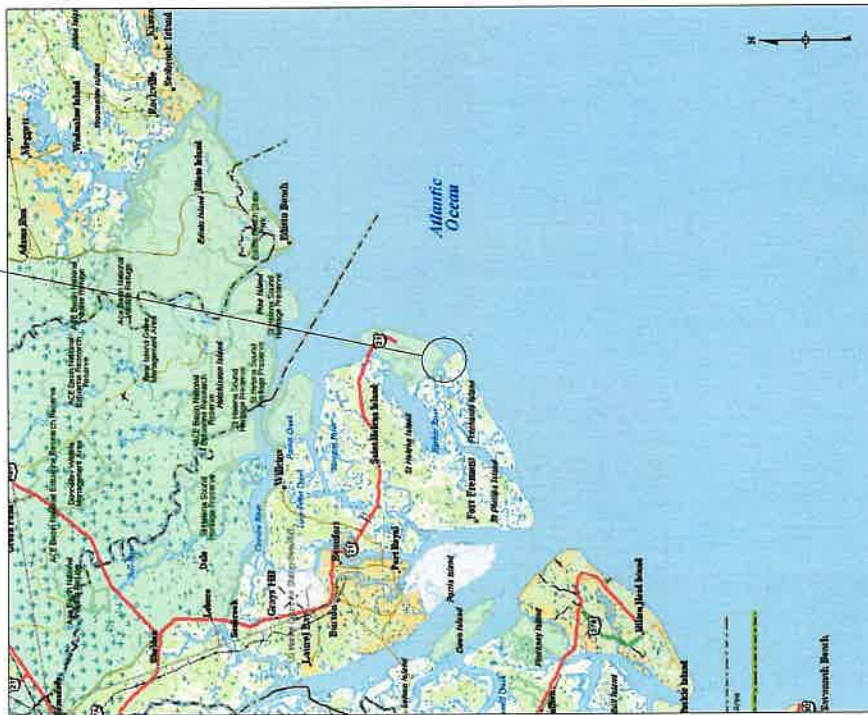
Thai G. Trinh, P.E.

Project Manager

## ***Appendix A***

### ***Bridge Drawings and Inspection Notes***

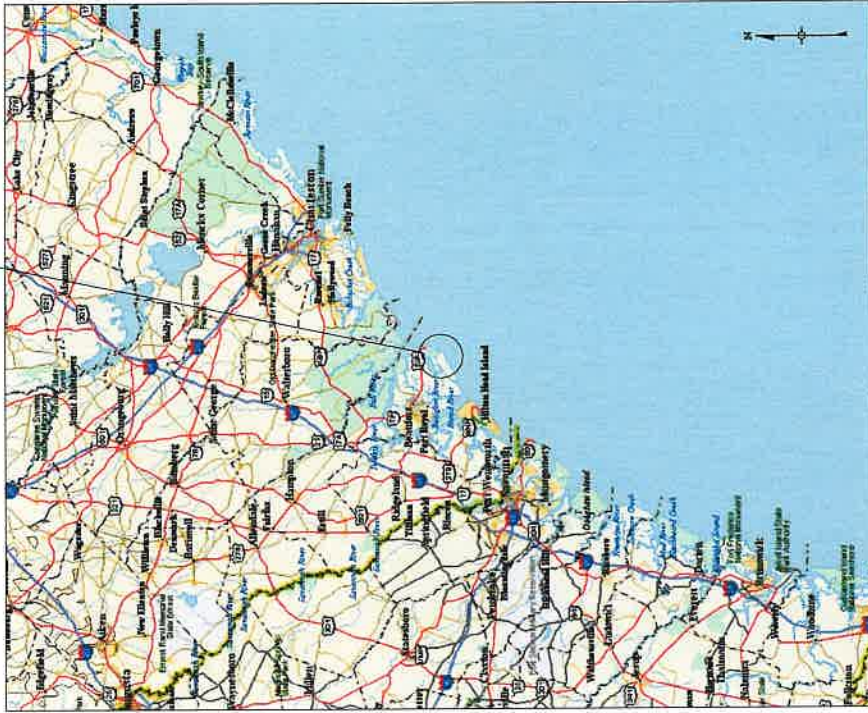
BRIDGE LOCATION



LOCATION

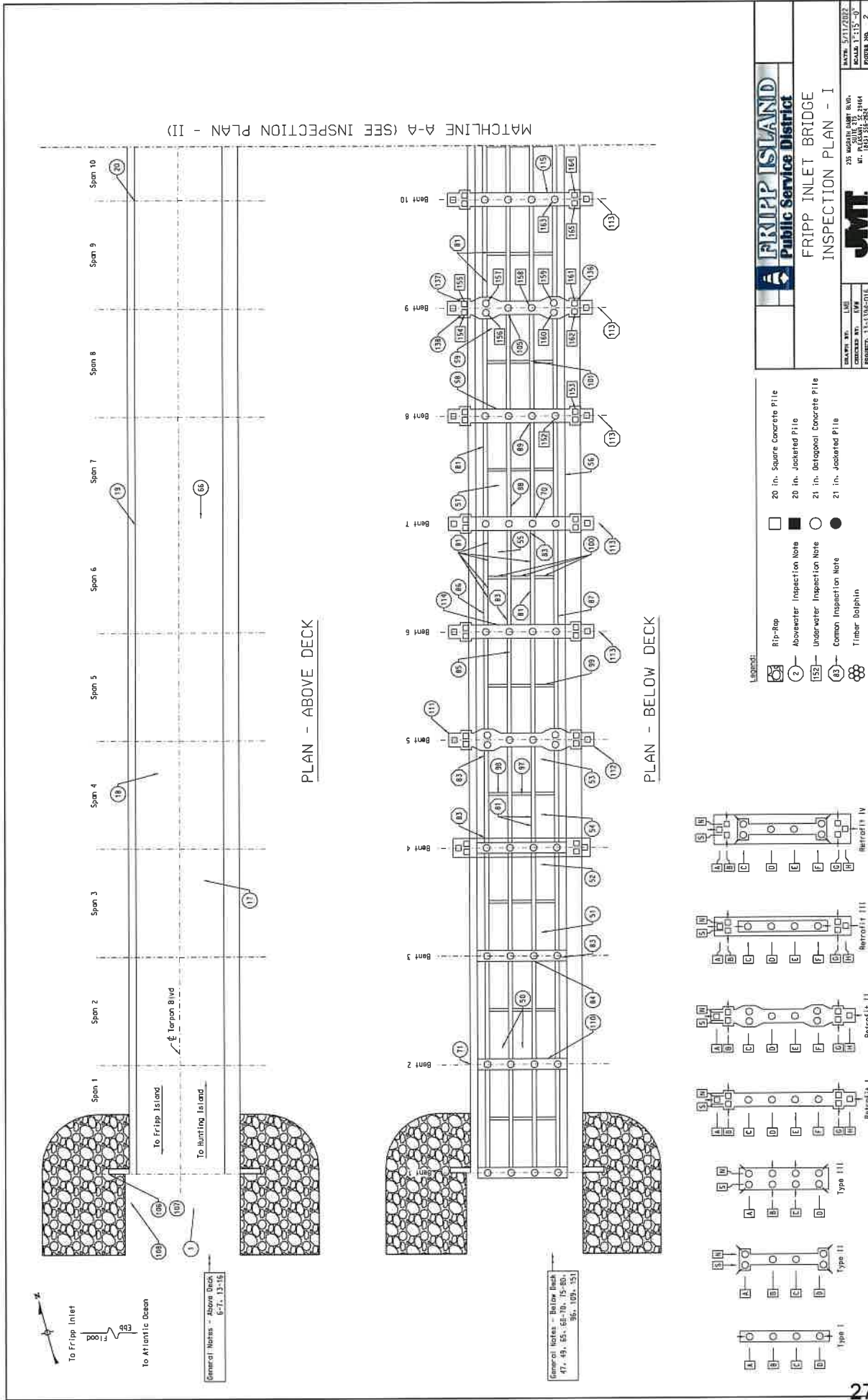
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 Longitude  $80^{\circ}-27'-15''$

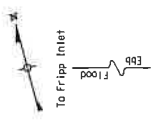
BRIDGE LOCATION



VICINITY

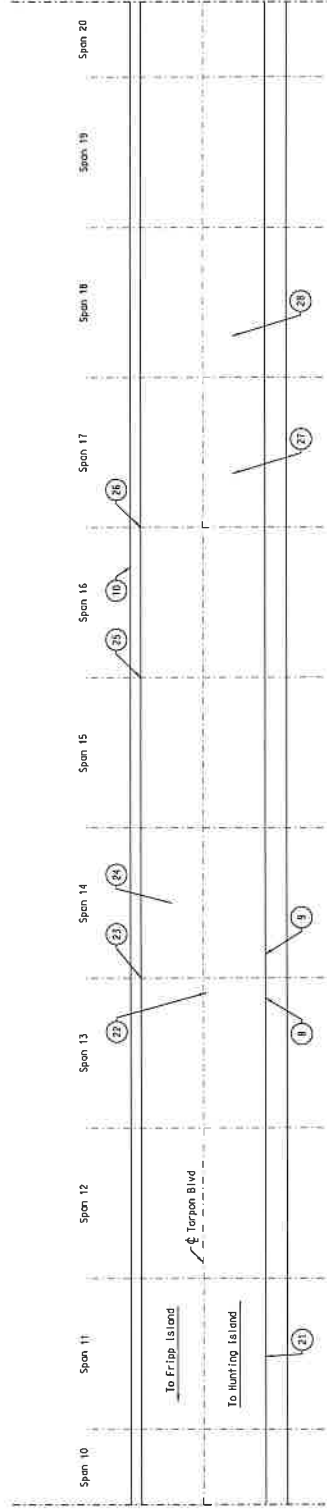
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FRIPP INLET BRIDGE LOCATION AND VICINITY		235 WASHBURN BLVD. MT. PLEASANT, SC 29561 PHONE NO. 1	
SHEET NO. 1 COUNTY: NEW PROJECT: 13-138-015	DATE: 5/11/2022 SCALE: PROJECT: 13-138-015		



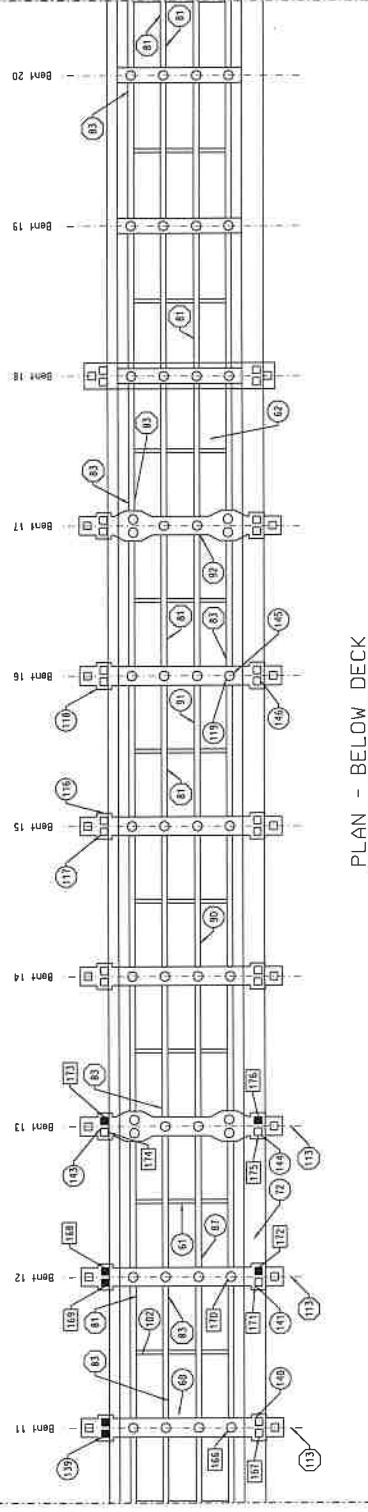


General Notes - Above Deck  
S-1, 13-15

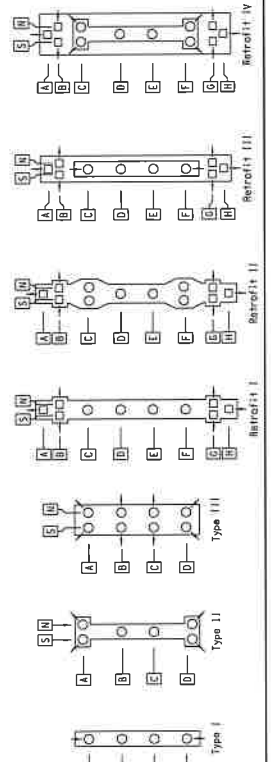
MATCHLINE A-A (SEE INSPECTION PLAN - I)



PLAN - ABOVE DECK



PLAN - BELOW DECK



- Legend:
- 20 in. Square Concrete Pile
  - 20 in. Jacketed Pile
  - 21 in. Octagonal Concrete Pile
  - 21 in. Jacketed Pile
  - Rip-Rap
  - Abovewater Inspection Note
  - Underwater Inspection Note
  - Common Inspection Note
  - Timber Dolphin



FRIPP INLET BRIDGE  
INSPECTION PLAN - II

DATE: 5/11/2022	SCALE: 1"=15'-0"	SHEET NO.: 3
DESIGNED BY: LUC	CHECKED BY: RW	PROJECT: 13-1384-01E
235 MARSH LANE BLDG.	MT. PLEASANT, SC 29564	PHONE NO.: 843-555-824





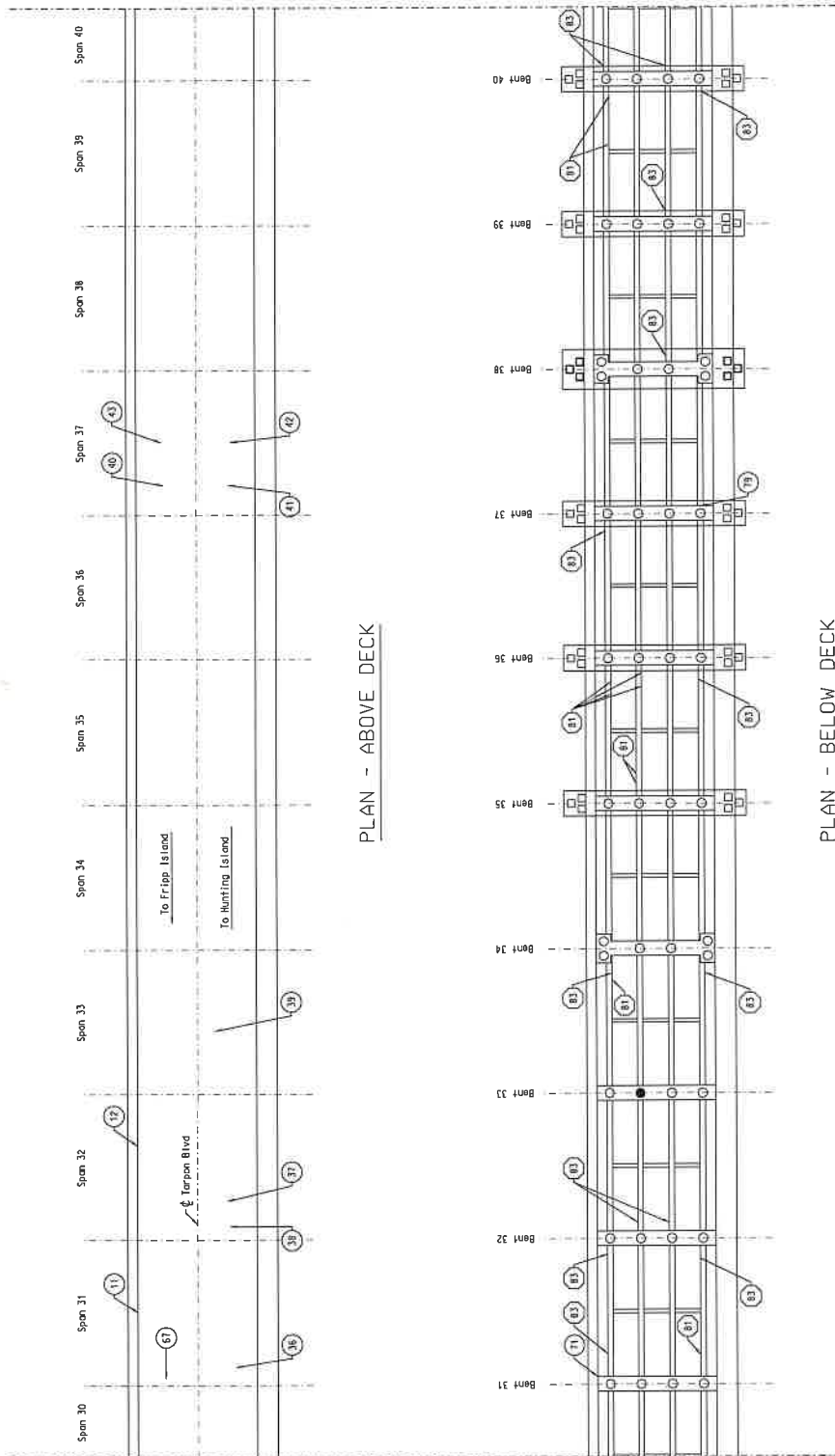


To Fripp Inlet

To Atlantic Ocean

General Notes - Above Deck  
#-7, 13-15

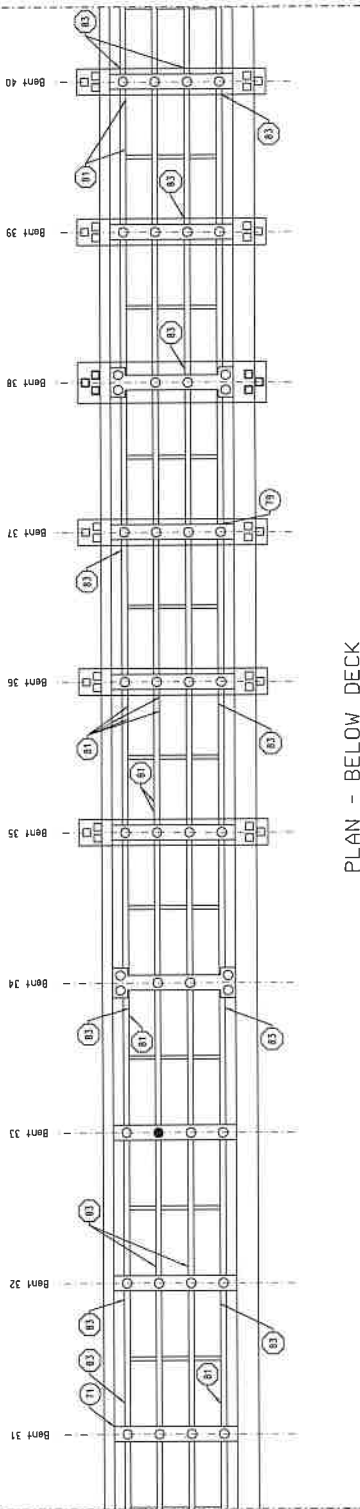
MATCHLINE C-C (SEE INSPECTION PLAN - III)



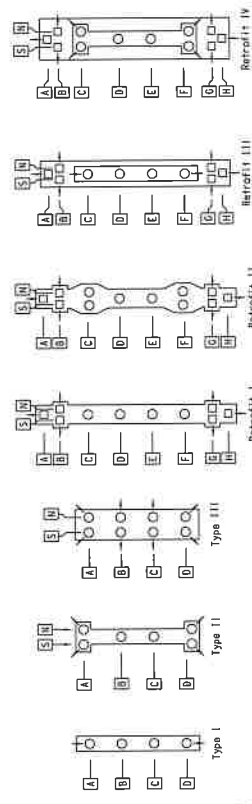
PLAN - ABOVE DECK

General Notes - Below Deck  
#7, 43, 55, 68-70, 75-80,  
95, 102, 151

MATCHLINE D-D (SEE INSPECTION PLAN - V)



PLAN - BELOW DECK



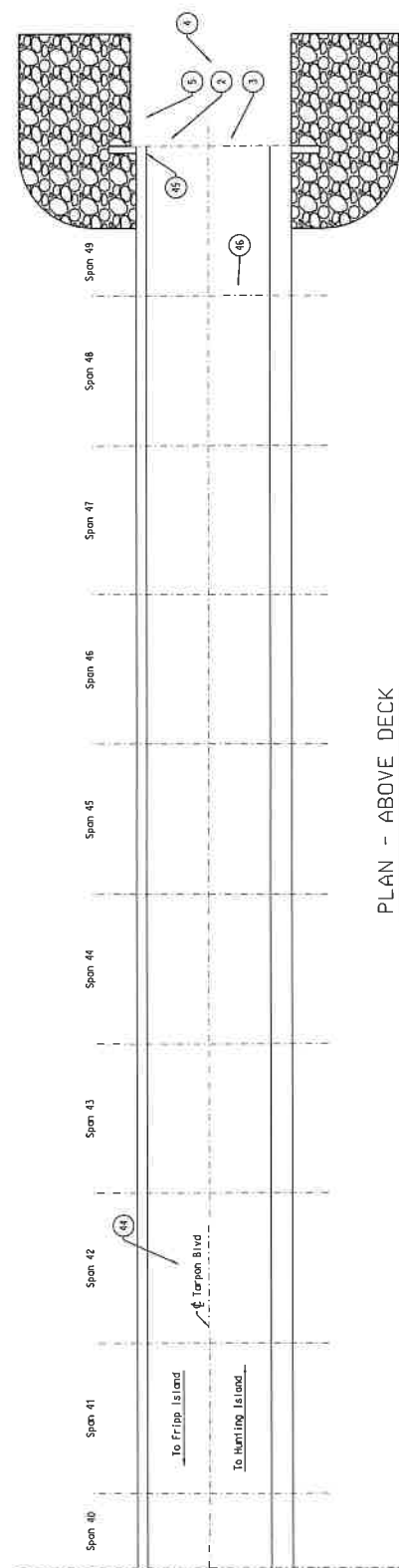
Legend:

- Rip-Rap
- 20 in. Square Concrete Pile
- 20 in. Jacketed Pile
- 21 in. Octagonal Concrete Pile
- 21 in. Jacketed Pile
- Timber Dolphin
- 2
- 13
- 83
- 84
- 85
- 86
- 87
- 88
- 89
- 90
- 91
- 92
- 93
- 94
- 95
- 96
- 97
- 98
- 99
- 100

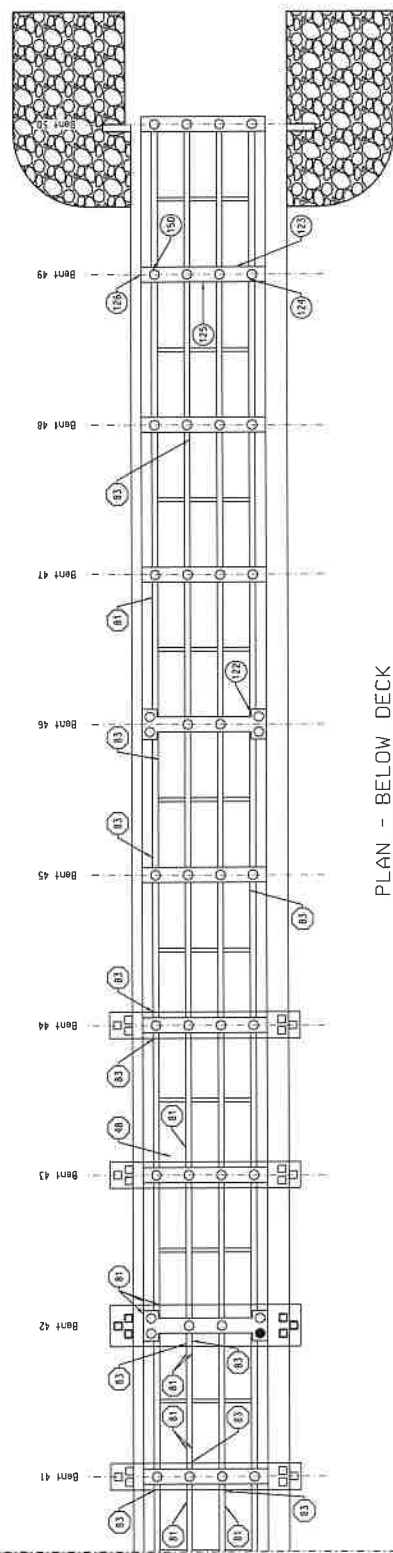
**FRIPP ISLAND**  
Public Service District

FRIPP INLET BRIDGE  
INSPECTION PLAN - IV

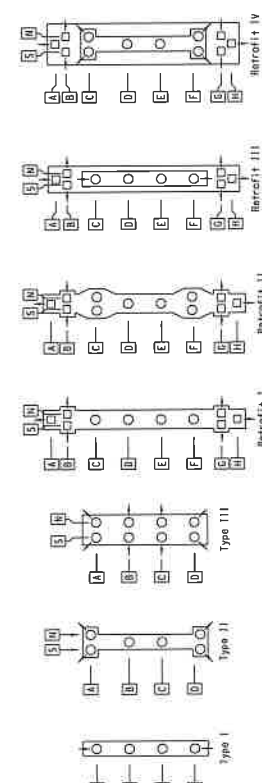
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CHECKED BY: LUT	PROJECT NO.: 2017-20-004	PROJECT NO.: 2017-20-004
APPROVED BY: JWM	PROJECT NO.: 2017-20-004	PROJECT NO.: 2017-20-004



PLAN - ABOVE DECK



PLAN - BELOW DECK



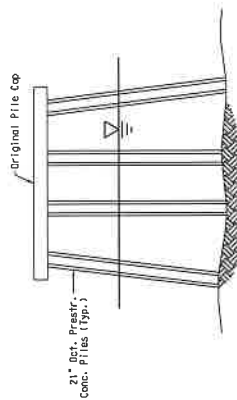
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  - 20 in. Jacketed Pile
  - 21 in. Diagonal Concrete Pile
  - 21 in. Jacketed Pile
  - Rip-Rap
  - Abovewater Inspection Note
  - Underwater Inspection Note
  - Common Inspection Note
  - Timber Dolphin

**FRIPP ISLAND**  
Public Service District

FRIPP INLET BRIDGE  
INSPECTION PLAN - V

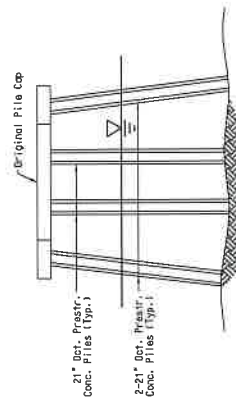
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PROJECT: 13-1384-01E





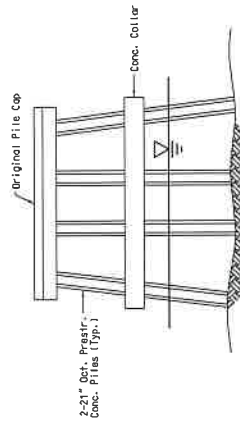
TYPE I BENT ELEVATION

(Typical of Bents 1-3, 19-20, 22-24, 27-29, 31-33, 45, and 47-50)



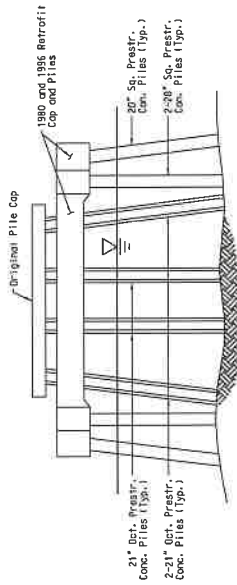
TYPE II BENT ELEVATION

(Typical of Bents 21, 30, 34, and 46)



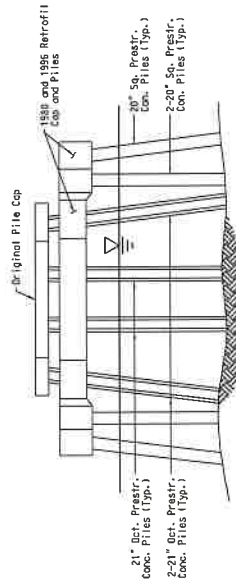
TYPE III BENT ELEVATION

(Typical of Bents 25 and 26)



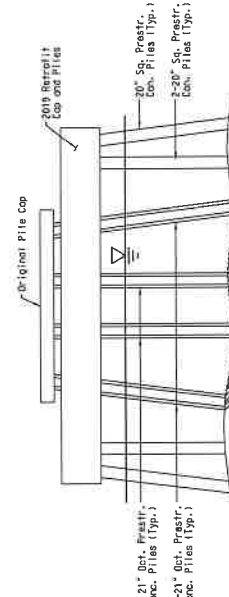
RETROFIT I BENT ELEVATION 1

(Typical of Bents 14, 15, and 16)



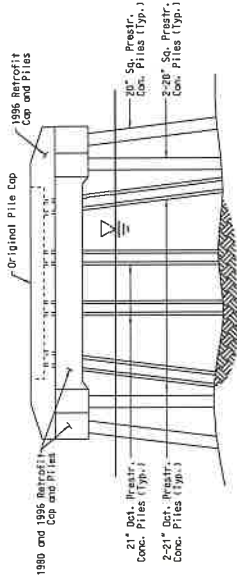
RETROFIT II BENT ELEVATION 1

(Typical of Bents 5 and 17)



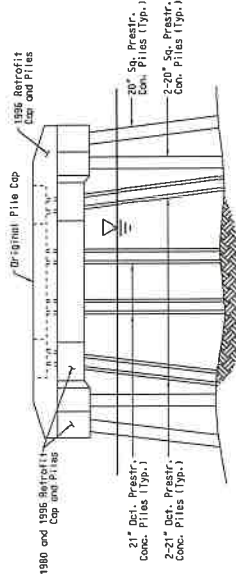
RETROFIT III BENT ELEVATION

(Typical of Bents 41, 18, 35-37, 39-41, and 43-44)



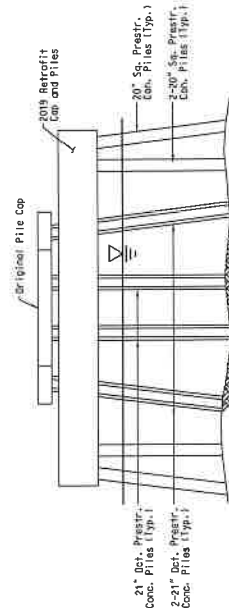
RETROFIT I BENT ELEVATION 2

(Typical of Bents 6-8, and 10-12)



RETROFIT II BENT ELEVATION 2

(Typical of Bents 9 and 13)



RETROFIT IV BENT ELEVATION

(Typical of Bents 38 and 42)

FRIPP INLET BRIDGE TYPICAL BENT ELEVATIONS	
DRAWN BY: LUC	DATE: 5/17/2023
PROJECT NO: 13-138-016	SCALE: 1"=8'-0"
DESIGNED BY: JMT	PROJECT NO: 13-138-016
CHECKED BY: JMT	PROJECT NO: 13-138-016
APPROVED BY: JMT	PROJECT NO: 13-138-016

# APPROACH

1. South approach road, transverse crack  $\frac{1}{8}$ " to  $\frac{1}{4}$ " wide, full width of roadway.
2. North approach road, 2" settlement at bent 50.
3. North approach road, up to 1" gap between approach road and end of bridge, vegetation growing in gap.
4. North approach road exhibited several longitudinal and transverse cracks up to  $\frac{1}{4}$ " wide.
5. North approach, west curb, spill 18" long x 6" vertical x  $3\frac{1}{2}$ " penetration.

# BRIDGE RAILINGS

6. General note, exposed rebar reinforcing at random isolated locations on the vertical posts.
7. General note, at random isolated locations along curb faces, shallow rebar spalls up to 3" dia. by  $\frac{1}{4}$ " penetration. Exposed bars with up to 20% loss of section.
8. Span 13, east fascia, north end of span, 6" by 8" by 1" penetration spall.
9. Bent 14, rail, top of vertical member, horizontal crack  $\frac{1}{2}$ " wide by 7" length.
10. Span 15, spill 18" by 8" by 1" penetration on underside of west rail located 8' south of Bent 17.
11. Span 31, west barrier, spill outside face 6" long x 6" vertical x 1" penetration, spill is partially covered with grout. Monitor during future inspections.
12. Span 32, outside of west rail located at  $\frac{1}{3}$  span, horizontal member, spill 8" horizontal by 6" wide by  $1\frac{1}{2}$ " penetration, fully covered by grout. Monitor during future inspections.

# DECK (Top)

13. General note, top of east sidewalk, random isolated hairline width cracks up to 4" length.
14. General note, top of deck, random isolated areas of hairline width top cracking covering 10% to 20% of deck area with hairline to  $\frac{1}{2}$ " transverse cracks present in isolated areas.
15. General note, centerline reflectors or raised pavement markers approximately 40% missing throughout bridge.
16. General note, numerous north and south scupper locations had one or two exposed shallow reinforcement with no appreciable loss of section.
17. Span 3, hollow sounding area in patchwork 5' long by 4' wide.
18. Span 4, west curb side, transverse cracks up to  $\frac{1}{8}$ " wide by 8" long, at 9" and 16" from the  $\phi$  of Bent 5.
19. Bent 7, transverse misalignment  $\frac{1}{2}$ " between span 6 (west) and span 7 (east).
20. Bent 10, transverse misalignment  $\frac{1}{2}$ " between span 9 (west) and span 10 (east).
21. Span 11, east sidewalk curb, 221 spill chips, up to 3" dia. by  $\frac{1}{2}$ " penetration.
22. Span 13, north end of span at mid-bridge,  $\frac{1}{2}$ " by 7' long transverse crack.
23. Bent 14, transverse misalignment up to  $\frac{1}{2}$ " between span 13 (east) and span 14 (west).
24. Span 14, west of the  $\phi$ ,  $\frac{1}{2}$ " transverse crack by 8' long.
25. Bent 16, transverse misalignment up to  $\frac{1}{2}$ " between span 15 (west) and span 16 (east).
26. Bent 17, transverse misalignment up to  $\frac{1}{2}$ " between span 16 (west) and span 17 (east).
27. Span 17, east curb side, transverse cracks up to  $\frac{1}{8}$ " wide by 8' long,  $12\frac{1}{2}$ " from the  $\phi$  of Bent 17.
28. Span 18, east curb side, transverse cracks up to  $\frac{1}{8}$ " wide by 7' long, 8' from the  $\phi$  of Bent 18.
29. Span 22, east side, 6' north of Bent 22, transverse crack  $\frac{1}{2}$ " wide by 8' long.
30. Span 25, east side, 5' north of Bent 25, transverse crack  $\frac{1}{2}$ " wide by 6' long.
31. Span 25, centerline, north  $\frac{1}{3}$  point of span, two transverse cracks  $\frac{1}{2}$ " wide by 8' long.
32. Span 25, west side, 10' north of Bent 25, three transverse hairline cracks 4' to 8' long.
33. Span 25, west side, 2 transverse hairline cracks located 6' and 20' south of Bent 26, 5'-6" long.
34. Span 26, west side, 15' north of Bent 26, transverse crack  $\frac{1}{2}$ " wide by 8' long.

# UTILITIES

69. General note ductile iron pipes, along east fascia of bridge exhibited light corrosion throughout the length of the bridge.
70. General note, inboard pipe hangers, along east fascia of bridge exhibited moderate corrosion at the deck bar insert.
71. Bent 2 west overhang, steel cable for utility support broken with 100% section loss.
72. East overhang near Bent 12 and extending into Span 12, 2" PVC conduit not attached and sagging below bridge.
73. Span 22 east overhang, 2" PVC conduit not attached and sagging below bridge.
74. Span 21 east overhang, 2" PVC conduit not attached and sagging below bridge.

# BEAMS

75. General note, previous beam repairs exhibited loose mortar/grout along edges of repair.
76. General note, beam sole plates exhibited moderate corrosion throughout. Associated with repainting and spalling at bottom flange at bearing jobs at random isolated locations. Up to full width x 1" penetration.
77. General note, at random isolated locations throughout all parts of beam, shallow reinforcement spalls up to 1" length with exposed reinforcing strand and up to 20% loss of section present.
78. General note, at random isolated locations, beam ends exhibited minor spalls/repairs spalls up to 18" by 3" with vertical cracking present. Exposed strands are present in some locations.
79. General note, at random isolated locations, beam and bottom corner spalls present, up to 6" dia. by full width of beam.
80. General note, beam insert spalls located at beam ends. Most have been previously grouted.
81. General note, shallow parapet spill up to 4" dia. 1 exposed reinforcing bar, with 10% section loss.
82. General note, shallow parapet spill 4" or greater to 6" dia. 1 exposed reinforcing bar, with 10% section loss.
83. General note, lifting hook grout pocket repair/failure.
84. Span 2, Beam 3, west face of bottom flange, crack up to  $\frac{1}{4}$ " wide by 2' length. From north end of beam
85. Span 5 beam 2, impending spill 1' dia. on underside of beam 5' from Bent 6.
86. Span 6, bottom of beam 1, 1' north of Bent 6, moderate corrosion from metal object left during construction.
87. Span 6, west face of beam 4, 3' north of Bent 6, shallow parapet spill 18" vertical x 4" horizontal, with 1 exposed reinforcement bar, up to 10% section loss.
88. Span 7 beam 2 at 4' north of Bent 7, spill in bottom flange 2' dia. by 2" penetration with 3 exposed strands and 20% section loss.
89. Span 7 beam 3 at Bent 8, spill in bottom flange 4' long by full width by 3" penetration with 4 exposed strands and up to 100% section loss.
90. Span 14, Beam 3, east face, spill  $1\frac{1}{2}$ " long by 6" vertical by  $\frac{1}{2}$ " penetration on bottom flange.
91. Span 15 beam 2 at 10' south of Bent 16, spill 18" long by 9" wide by 1" penetration and no exposed reinforcement.
92. Span 16, beam 3, at Bent 17, spill, full width of bottom flange at bearing line, 12" long x  $\frac{1}{2}$ " penetration with no exposed strands.

# APPROACH

35. Span 29, mid-span, transverse hairline crack, 5' long.
36. Span 31, east side 2' north of Bent 31, 4" long shallow rebar spill with exposed reinforcement.
37. Span 32, east side, midpoint point of span, transverse crack hairline to  $\frac{1}{2}$ " wide by 3' long.
38. Span 32, east side, 1' north of Bent 32, transverse crack hairline to  $\frac{1}{2}$ " wide by 3' long.
39. Span 31, east side, mid-span, transverse crack  $\frac{1}{2}$ " wide by 6' long.
40. Span 31, west side, 10' north of Bent 31, transverse crack  $\frac{1}{2}$ " wide by 9' long.
41. Span 37, east side, 10' north of Bent 37, transverse crack  $\frac{1}{2}$ " wide by 8' long.
42. Span 37, east side,  $\frac{1}{2}$ " transverse crack at mid-span by 11' long.
43. Span 37, east side,  $\frac{1}{2}$ " transverse crack at mid-span by 5' long.
44. Span 42, west side,  $\frac{1}{2}$ " transverse crack by 5' long at mid-span.
45. Span 49, east and west side, two  $\frac{1}{2}$ " transverse cracks up to 8' long, located 1' north of Bent 49.
46. Span 49, corner of west sidewalk, spill 6" long x 6" wide x 2" penetration.

# Deck (Underside)

47. General note, underside of deck, random isolated areas of minor poor consolidation.
48. General note, underside of deck, random isolated areas of shallow rebar spalls with light corrosion. The reinforcement at a few of these spalls had been previously galvanized.
49. General note, underside of deck, random isolated minor hairline cracks.
50. Span 2, 4' north of Bent 2 between beams 1 and 2, and beams 2 and 3, impending spill 5' dia.
51. Span 3, underside of deck, between beams 3 and 4, spill 2' by 2' by 1" penetration, rust staining present.
52. Span 3, underside of deck, between beams 3 and 4, 3 impending spalls, 3" dia, rust staining present.
53. Span 4, underside of deck, between beams 3 and 4, 3" by 2' area impending spill.
54. Span 4, underside of deck, between beams 3 and 4, spill  $1\frac{1}{2}$ " wide by 1' long by 4" penetration with 3 exposed reinforcement. Minor section loss.
55. Span 6 underside of deck between beams 1 and 2, spill 1' dia. by 1" penetration with 1 exposed reinforcement and 20% section loss.
56. Span 7, east fascia of deck, spill 1' length by 4" vertical by 4" horizontal by 2" penetration.
57. Span 7, bottom of deck, between beams 1 and 2, spill 1' dia. covered by wood.
58. Span 8 between beam 1 and 2 at Bent 8, impending spill 2' dia. in bottom of deck.
59. Span 8, underside of deck, between beams 1 and 2, spill 1' by 2'.
60. Span 11, bottom of deck, between beams 2 and 3, 12" by 10" area of delamination.
61. Span 12 between beam 2 and 3 at midspan, spill 6" dia. by 1" penetration with 1 exposed reinforcement and 10% section loss.
62. Span 17, bottom of deck, between beams 3 and 4, 4' long horizontal hairline crack with efflorescence.
63. Span 25, bottom of deck, north side of span between beams 2 and 3, 7' long hairline crack exhibiting efflorescence.
64. Span 25, bottom of deck, spill 2' long by 1' by 2" penetration with 3 exposed reinforcement and 10% section loss.

# JOINTS

65. General note, joints recessed up to 1" deep, sand and gravel debris on top of compression seal throughout, concentrated at curbs.
66. Bent 7, joint, compression seal covered with silicone sealant.
67. Bent 31, joint, compression seal covered with silicone sealant.

# BRAM SCUPPERS

68. General note, numerous scuppers throughout the length of the bridge exhibited corrosion holes up to 4".



## FRIPP INLET BRIDGE INSPECTION NOTES - I

REPORT BY: JMT	DATE: 5/17/2023
CONDUCTED BY: JMT	SCALE: AS SHOWN
PROJECT: 13-1384-016	PROJECT NO: 8



235 MARSH LANE, SUITE 100  
MT. PLEASANT, SC 29564  
803-335-5841

SCALE: AS SHOWN  
PROJECT NO: 8

120. Bent 25, pile cap, south face at pile B South, vertical hairline crack by 2' long.
121. Bent 30, underside of pile cap, spill at Pile D North 8' dia. by  $\frac{1}{2}$ " penetration.
122. Bent 46, pile cap, spill 12" dia. by  $\frac{1}{2}$ " penetration with exposed reinforcement 502 loss of section located at Pile C North.
123. Bent 49, pile cap, hairline to  $\frac{1}{2}$ " wide horizontal crack along the full length of the north face and south face.
124. Bent 49, pile cap, spill 12" by 8" by 2" penetration located southeast of Pile D on corner of pile cap.
125. Bent 49, pile cap, on the south face a horizontal crack  $\frac{1}{2}$ " wide extending the full length of the cap face.
126. Bent 49, pile cap, 14" wide by 9" vertical by 7" penetration spill located on west face bottom corner.
127. Bent 25, collar, south fascia thru entire east face radius, 3' wide by 2' high by 5" penetration on spill and impending spalls with rust staining.
128. Bent 25, collar, throughout north and south fascia, impending spalls from piles A to D, with rust staining.
129. Bent 25, collar, south fascia, west end, spill with rust staining 3' length by 5" width by 3" penetration with  $\frac{1}{2}$ " wide cracks.
130. Bent 25, collar, north fascia,  $\frac{1}{2}$ " cracks with impending spalls up to 7' length.
131. Bent 26, collar, north fascia, horizontal hairline crack mid-height full length of strut.
132. Bent 26, collar, north fascia, rust staining mid-span of strut.
133. Bent 26, collar, north fascia, full height spill 3' long x 6" deep, 100% section loss, with rust staining.
134. Bent 26, collar, 2' dia. spill by 5" penetration on west face of strut. Exposed reinforcing and rust staining present.
135. Bent 26, collar, north fascia,  $\frac{1}{2}$ " horizontal cracks with rust staining, spill 2' by 1", with exposed reinforcement with 20% loss of section, and impending spalls along the full length of collar.
- PILES
136. Bent 9, Pile D North, north east corner, vertical crack  $\frac{1}{2}$ " wide 1' long.
137. Bent 9, Pile B North, north west corner, vertical crack  $\frac{1}{2}$ " wide 1' long with adjacent rust staining.
138. Bent 9, Pile B South,  $\frac{1}{4}$ " vertical crack by 20" length located at top of pile at south west corner.
139. Bent 11, Pile B South, south west and north west corners, vertical crack  $\frac{1}{2}$ " wide by  $\frac{1}{2}$ " long, South west corner exhibits rust staining.
140. Bent 11, Pile D North, north west corner, vertical crack  $\frac{1}{2}$ " wide by 2' long, 30" by 8" area of delamination.
141. Bent 12, Pile G South, west face, impending spill from the cap down 4' with rust staining.
143. Bent 13, Pile B South, northwest and southeast corner, crack  $\frac{1}{2}$ " wide with rust staining 2'-6" long.
144. Bent 13, Pile G South, crack  $\frac{1}{2}$ " wide with rust staining from the cap down 3'.
145. Bent 16, Pile F, east face, hairline vertical crack with rust staining approximately 4' below cap.
146. Bent 21, Pile D South, north face, hairline vertical crack from cap down 1'-3".
147. Bent 21, Pile D-South, north west face near pile cap,  $\frac{1}{2}$ " by 2' long crack with associated 12" x 12" area of delamination.
148. Bent 23, Pile D, west face, hairline horizontal crack, 17" length located 18" from top of pile.
149. Bent 23, Pile C North, north face of pile, 18" below cap,  $\frac{1}{2}$ " wide horizontal crack by 54" long, 18" wide around south west face to east face.
150. Bent 49, Pile A,  $\frac{1}{2}$ " horizontal crack located at top of pile and extending around the entire perimeter.

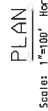
DRAWN BY: L.M.D.	DATE: 11/1/83
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GRAPH BY: LHM	DATE: 5/11/2022
CHECKED BY: JWK	SCALE: MD SCALE
PROJECT: 13-117-75-C	PLOTING NO: 12

## ***Appendix B***

### ***Bridge Soundings***

- 1951 channel bottom profile was developed from construction documents dated 1961.
- 2011 channel bottom profile was developed from the hydrographic survey completed by GEL Engineering, LLC.
- 1919 channel bottom profile was developed from the hydrographic survey completed on October 2, 2013 by GEL Engineering, LLC.
- 2022 channel bottom profile was developed from the hydrographic survey completed on February 6, 2022 by GEL Engineering, LLC.
- The 1919, 1951, 2011, and 2022 channel bottom profiles and existing construction documents dated 1961, 1980, 1986, and 1998 provided by Tri-State Public Utilities Service District.



Ⓐ 1980 Repair plans specify that pile tips to be determined by test piles. Test Pile data is not available, pile tips are based on 1996 construction documents.

Ⓑ 2011 GEL Hydrographic Survey used as baseline survey.



Figure 1: Schematic representation of the experimental design. The figure shows five vertical timelines for different groups: Pile Tip Elevations, 1961 Channel Bottom, 2011 Upstream Channel Bottom (By GEL), 2019 Upstream Channel Bottom (By GEL), and 2022 Upstream Channel Bottom (By GEL). Each timeline has a vertical axis from 0 to 1000. The 1961 Channel Bottom timeline shows a blue line at 0. The 2011 Upstream Channel Bottom (By GEL) timeline shows a blue line at 0 and a red line at 1000. The 2019 Upstream Channel Bottom (By GEL) timeline shows a red line at 1000. The 2022 Upstream Channel Bottom (By GEL) timeline shows a green line at 1000.

FRIPP INLET BRIDGE  
PLAN AND UPSTREAM PROFILE

BRANCH BY	LMB
CHECKED BY	KW
PROJECT	13-1394-016



235 WEAALTH DABBT BLVD, SUITE 205 MO. PLEASANT SC 29164 18431 555-2624	DATE: 5/16/2022
	RECALL AS SHOWN
	PHOTOS: 10







June 9, 2022

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

RE: Re-evaluation of the Fripp Island Bridge Replacement Cost

Dear Ms. Hughes,

Johnson, Mirmiran, and Thompson (JMT) is pleased to submit this cost proposal to Fripp Island Public Service District (FIPSD) to perform a re-evaluation of the previously developed bridge replacement cost estimate of the Fripp Island Bridge.

**Project Understanding / Scope of Services**

JMT understands that the FIPSD requires a re-evaluation of the previously developed Fripp Island Bridge Replacement Cost. This will include a review of the previously developed estimate to review methods are still recommended, review unit costs with the most recent price indices and supply trends and update the Report with the latest estimate and research completed. It is assumed there will be two project meetings associated with this effort.

**Project Schedule**

Once the notice to proceed is given, JMT anticipates completing the task within 20 calendar days.

**Client Responsibilities**

Review revised cost estimates and report and provide comments within 7 calendar days.

**Compensation**

"Scope of Services" defined above and on the Activity Description Sheet (attached) will be provided for a proposed Lump Sum fee of \$11,398

"Additional Services" will be negotiated as such time as deemed necessary.

It is anticipated that this project will be accomplished under a new Task Order under original Contract Agreement executed on February 11, 2014.

This scope of services may be amended as needed according to your project requirements and JMT will happily modify any effort or fees at your request to better suit your needs. I thank you for your time and consideration in this matter and again, I look forward to a successful project completion. Should

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you have any questions regarding these items, please do not hesitate to call me at 843-556-2624 or [joconner@jmt.com](mailto:joconner@jmt.com), or task leader Jennifer Ray at 410-316-2231 or [jray@jmt.com](mailto:jray@jmt.com).

Very truly yours,

JOHNSON, MIRMIRAN & THOMPSON, INC.

A handwritten signature in black ink, appearing to read "Jim O'Connor".

Jim O'Connor, PE  
Vice President

Cc: Jennifer J. Ray  
Thai Trinh



Activity ID	ACTIVITY DESCRIPTION	Project Manager	Senior Transportation	Structural Engineer	Transportation Planner	TOTAL
<b>1</b>	<b>Cost Estimate Re-evaluation</b>	<b>2.0</b>	<b>14.0</b>	<b>12.0</b>	<b>20.0</b>	<b>48.0</b>
1.1	Review prior estimate for necessary changes	0.0	4.0	6.0	8.0	18.0
1.2	Review unit prices for latest cost, including current trends	0.0	6.0	6.0	8.0	20.0
1.3	Update cost estimate	2.0	2.0	0.0	4.0	8.0
1.4	Develop anticipated inflation chart	0.0	2.0	0.0	0.0	2.0
<b>2</b>	<b>Revise Report</b>	<b>4.0</b>	<b>8.0</b>	<b>2.0</b>	<b>12.0</b>	<b>26.0</b>
2.1	Revise Report for new cost estimate	2.0	4.0	2.0	8.0	16.0
2.2	Submit Revised Draft Report for Review	0.0	1.0	0.0	0.0	1.0
2.3	Refine Revised Draft Report from comments received	2.0	2.0	0.0	4.0	8.0
2.4	Submit Revised Final Report	0.0	1.0	0.0	0.0	1.0
<b>3</b>	<b>Project Management</b>	<b>4.0</b>	<b>4.0</b>	<b>0.0</b>	<b>0.0</b>	<b>8.0</b>
3.1	Virtual Project Meetings (2)	4.0	4.0	0.0	0.0	8.0
						0.0
						0.0
	TOTAL PROJECT HOURS	10.0	26.0	14.0	32.0	82.0