



ARTIBUS DESIGN

ENGINEERING AND PLANNING

Task Order #1808

Structural Engineering Design Services

Emergency Stabilization Repairs

Fleming Key Utility Bridge, Key West, FL 33040

Prepared for

City of Key West Utilities Department

June 19, 2019

By:

**Artibus Design LLC,
3706 N Roosevelt Blvd, Suite i-208
Key West, FL 33040**

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FLEMING KEY UTILITY BRIDGE, CITY OF KEY WEST



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City of Key West Areal Map



Location Map



Project Description:

As a result of impact of an impact by a vessel (reportedly - barge) one of the pre-stressed concrete piles supporting a bent of a wastewater utility crossing was severely damaged and second one damaged. The incident created an immediate safety hazard to the navigation of numerous boats under the bridge, potential environmental damage by raw waste spill and most dangerous an interruption to the operation of the wastewater utility servicing City of Key West and Navy facilities located on the island.

Following is a short report prepared by Serge Mashtakov PE upon the site visit and inspection on 04/23/2019.

1) Front pile (which was hit) is one of two piles supporting the bent is in a state of complete structural failure. It is sheared off in multiple locations and delaminated above.

It is likely to be damaged below the water line. Both piles are on angle and are leaning against the bridge bent. There is very little redundancy otherwise.

2) Rear pile appears to have no direct damaged - but there is a significant observable with naked eye crack at the bent. It is possible that pile is damaged below the water line or even mud-line since bent of the pipe bridge hit an older bent of the vehicular bridge (owned by Navy).

3) There is minor damaged to the bent mostly edge split from the impact. Navy bridge concrete spalling patching is delaminated.

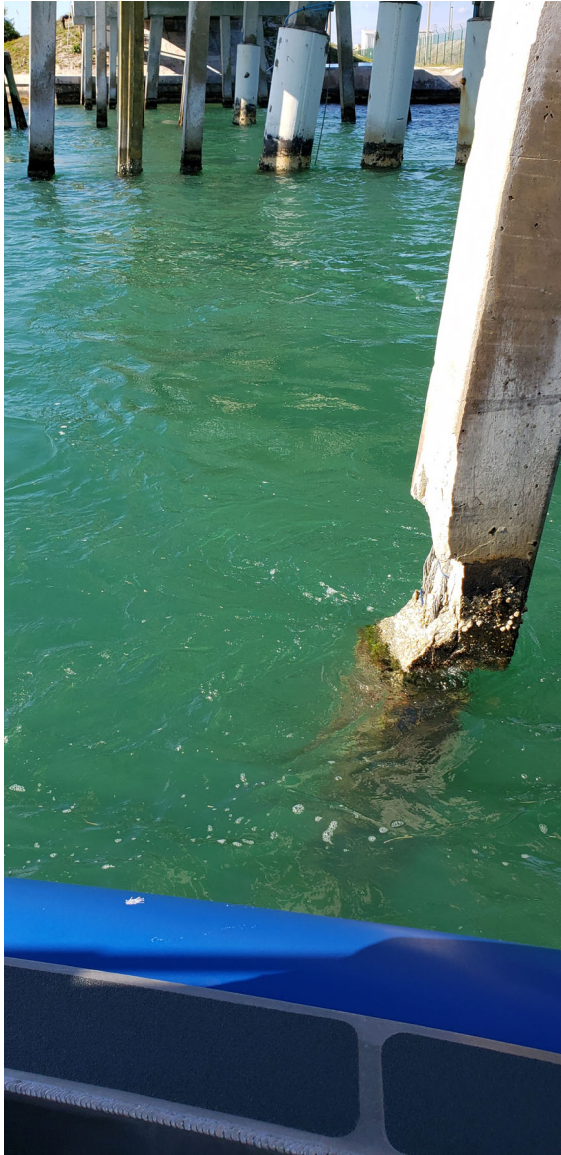
4) Pier supports two main sewer in-fluent lines servicing entire City of Key West. Any interruption of this service would be nearly catastrophic.

5) Any potential raw sewer spill into the waters would be just as damaging to the environment.

Following are some representative photographs of the impacted pier:



Figure 1. Top bent of the utility bridge supporting two 32" sanitary influent lines and results of an impact of the bent into Navy owned vehicular bridge.



Figures 2 and 3. Bottom of the pier snapped and heavy damage to the top.



Figure 4. Outer pier at water level. Complete loss of section and damage to reinforcement tendons.

This task order includes a specialty engineer services for utility and vehicular bridge design and calculations together with our construction administration, inspections and coordination services. The task order is being prepared after the factual work due to emergency nature of the situation.

Please note that several preliminary designs were evaluated due to coordination with available contractor, space constraints and readily available materials at the time of emergency.



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Artibus Design LLC is pleased to present this engineering service proposal for the scope described below.

Scope of work:

Task 1. Coordination of Specialty Engineer, site meeting and design scope definition.

1.1 Coordinate with specialty engineer on-site meeting present the damaged structure. Measure existing condition and

1.2 Define limits of the replacement and expected field conditions. (Match existing curb and railing style, expansion joint finishes, total deck depth, etc.)

Task 2. Specialty Engineer bridge design.

2.1 See Appendix "A" for HighSpans Engineering, Inc invoices with applicable hours.

Task 3. Review of the design drawings and reports.

3.1 Review of the progress and final drawings and calculation reports for completeness and coordination with on-site conditions. (Please note the Specialty Engineer of Record is responsible for structure adequacy meeting current design loads).

Deliverables:

1. Up to five (5) site visits, participation in emergency meetings and conference calls for field co-ordinations, inspections etc.

2. Preliminary design options and final design for temporary support structure able to sustain the utility bridge for prolonged period of time while permanent repairs are being evaluated, designed, permitted.

3. Inspections of the stabilization installation

4. Final certification of the stabilization for re-opening of the bridge for boat traffic.

Please note - that non-critical repairs of the bridge superstructure, piles cap beams, curbs are not included in this proposal and are planned for future periods.

Assumptions:

1. City will provide any available documents related to the original construction and improvements (if available).

2. City will provide full and unrestricted access to the property during normal work hours Monday-Friday 7 am till 5 pm.

3. It is understood that the work may be terminated at the end of any task, if the City deems necessary.



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ENGINEERING AND PLANNING

Schedule of Hourly Rates (Per Approved Contract)

Title or work description	Hourly Rate
Licensed Professional Engineer (P.E.)	\$150.00
Project Manager	\$130.00
Certified Engineer Intern (E.I.)	\$110.00
Structural Inspector (non P.E.)	\$110.00
Expert Witness (Legal)	\$350.00
Inspector (non P.E.)	\$90.00
Engineering Technician	\$85.00
Drafting Technician	\$85.00
Clerical	\$65.00

Schedule of Reimbursable Expenses

Item description	Rate
Large Format Prints (Arch-D, 24"x36") Color	\$35.00/Each
Large Format Prints (Arch-D, 24"x36") Black&White	\$15.00/Each
Prints (Tabloid, 11"x17") Color	\$5.00/Each
Prints (Tabloid, 11"x17") Black&White	\$0.75/Each
Prints (8.5"x11") Color	\$0.50/Each
Prints (8.5"x11") Black&White	\$0.25/Each
Binding Large Format	\$50.00/Each
Binding Tabloid and Letter Format	\$20.00/Each
Mailing and Shipping Expenses	Cost + 20%
Travel Expenses (outside Monroe County)	Cost + 20%
Misc. (Discs, Flash Drives, etc.)	Cost + 20%

Client:
 Signature _____ Date _____
 James K. Scholl
 City Manager

By: *Serge Mashtakov* Date 06/19/2019
 Signature _____
 Serge Mashtakov, PE
 President, Artibus Design LLC



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Appendix "A"
HighSpans Engineering, Inc
Invoices #: 056.02.01 and .02
(see attached)

Invoice Number: 056.02.01
Invoice Period: 04/22/19 to 04/25/19
Project Name: Fleming Key Pier Emergency Repairs
Owner: City of Key West
Owner Project No.:
Client: Artibus Design
Client Contact: Serge Mashtakov, PE
Address: 3706 N. Roosevelt Blvd. - Suite I-208
 Key West, FL 33040
Phone: 305-304-3512
Email: Serge@ArtibusDesign.com

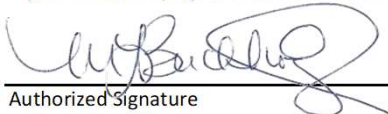
Submitted: 5/10/2019
 Submitted by: Schelle Buchholz
 Phone: 239.573.8912
 Sbuchholz@HighSpans.com

INVOICE

Task Description	Type*	Sch	Total Estimate	%	Complete	Total Billed To Date	Previous Billings	Amount Due This Period
Task 1: Temporary Support	LA	A	\$ 10,000.00	80.63%		\$8,062.50	\$0.00	\$8,062.50
Task 2: Inspection/Certification								
Task 3: Permanent Concrete Bent								
Task 4: Post Design								
Task 5: Inspection/Site Visits								
Subtotal Original Tasks			\$ 10,000.00	80.63%		\$8,062.50	\$0.00	\$8,062.50
Added Tasks								
	A		\$ -			\$0.00	\$0.00	
Subtotal Added Tasks			\$ -			\$0.00	\$0.00	\$0.00
TOTAL ORIGINAL AND ADDED TASKS			\$ 10,000.00	80.63%		\$8,062.50	\$ -	\$8,062.50

Total	\$8,062.50
Net 45 Days from Submitted Date	
Remit to:	
HighSpans Engineering, Inc. 2121 McGregor - Suite 201 Ft. Myers, FL 33901	

By submittal of this invoice, HighSpans Engineering, Inc. certifies that reimbursable costs contained in this invoice represent actual project costs as reflected in our accounting records for the above referenced project.


 Authorized Signature

CFO
 Title

5/10/2019
 Date

*(LA) - Limiting Amount (LS) - Lump Sum

Invoice Number: 056.02.01 Invoice Period: 4/22/2019 - 04/25/19
 Client Project #: 0



SCHEDULE A

Lump Sum Task Details - This Period

Original Lump Sum Tasks

Task	Status This Period	Budget	x	This Period % Billable	=	Billable This Period
Design Support Including:		\$0.00				\$0.00
				0%		\$0.00
				0%		\$0.00
				0%		\$0.00
				0%		\$0.00
				0%		\$0.00
				0%		\$0.00
Subtotal - Original Lump Sum Tasks						\$0.00

Added Lump Sum Tasks: None

Subtotal - Added Lump Sum Tasks						\$0.00

Not To Exceed Tasks - Fleming Key Pier Emergency Repairs

Task 1	Status	Service	Hours	x	Rate	=	This Period
Task 1 - Temporary Support	*	Sr. Project Engineer	19.00		\$180.00		\$3,420.00
		Sr. Inspector			\$93.00		\$0.00
Task 1 - Temporary Support	*	EITs	31.50		\$78.00		\$2,457.00
		Inspector			\$69.00		\$0.00
Task 1 - Temporary Support	*	Sr. CADD Tech	23.50		\$93.00		\$2,185.50
			74.00				

*Submitted 4/25/19

Subtotal - Added Hourly Tasks **\$8,062.50**

Total Original & Added Tasks This Period **\$8,062.50**

Project Status Report #1

Project Name: Fleming Key Pier Emergency Repairs
Client: Artibus Design Engineering and Planning
Consultant: HighSpans Engineering, Inc.
Report Period: April 26 – May 31, 2019

Project Status Discussion:

After initial emergency repair plans were submitted on 4/25/19 (previous status), the Contractor requested redesign based on field issues. On 4/29/19 design request was made to add extra H-piles. On 5/18/19, request for revision from City of Key West was received regarding cap support. On 5/20/19, request for redesign was made to substitute wooden saddles to concrete by the Contractor. Sr. Inspector travelled to Key West May 15 - 17, 2019. Principal Engineer travelled to Key West for inspection and final certification May 20 – 21, 2019.

Complete signed and sealed certification submitted May 23, 2019 after earlier inspection and additional information from the Contractor. Permit set was signed and sealed.

On 5/29/19, HEI provided Esbary temporary support cad file.

Active Tasks This Period	Status Summary
Site Inspections	Sr. Inspector – 3 days 5/15 – 5/17/19 Principal Engineer – 2 days 5/20 – 5/21/19
Utility Coordination	N/A
Schedule Review	N/A
Plan Status	Submitted 5/23/2018;
City of Key West	Meetings during inspections.
Special Tasks	None this period.

Invoice Number: 056.02.02
Invoice Period: 04/26/19 to 05/31/19 5 Weeks
Project Name: Fleming Key Pier Emergency Repairs
Owner: City of Key West
Owner Project No.:
Client: Artibus Design
Client Contact: Serge Mashtakov, PE
Address: 3706 N. Roosevelt Blvd. - Suite I-208
 Key West, FL 33040
Phone: 305-304-3512
Email: Serge@ArtibusDesign.com

Submitted: 6/17/2019
 Submitted by: Schelle Buchholz
 Phone: 239.573.8912
 Sbuchholz@HighSpans.com

INVOICE

Task Description	Type* Sch	Total Estimate	% Complete	Total Billed To Date	Previous Billings	Amount Due This Period
Task 1: Temporary Support	LA A	\$ 10,000.00	80.63%	\$8,062.50	\$8,062.50	\$0.00
Task 2: Inspection/Certification Temporary Support				\$5,443.90	\$0.00	\$5,443.90
Task 3: Permanent Concrete Bent				\$5,017.50	\$0.00	\$5,017.50
Task 4: Post Design				\$0.00	\$0.00	
Task 5: Inspection/Site Visits				\$0.00	\$0.00	\$0.00
Subtotal Original Tasks		\$ 10,000.00	185.24%	\$18,523.90	\$8,062.50	\$10,461.40
Added Tasks						
Re-design emergency repair	A	\$ -		\$15,604.50	\$0.00	\$15,604.50
Site Visits Inspections		\$ -				
Subtotal Added Tasks		\$ -		\$15,604.50	\$0.00	\$15,604.50
TOTAL ORIGINAL AND ADDED TASKS		\$ 10,000.00	341.28%	\$34,128.40	\$ 8,062.50	\$26,065.90

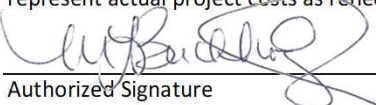
Total \$26,065.90

Net 45 Days from Submitted Date

Remit to:
HighSpans Engineering, Inc.
2121 McGregor - Suite 201
Ft. Myers, FL 33901

*(LA) - Limiting Amount (LS) - Lump Sum

By submittal of this invoice, HighSpans Engineering, Inc. certifies that reimbursable costs contained in this invoice represent actual project costs as reflected in our accounting records for the above referenced project.


 Authorized Signature

CFO Title
 6/17/2019 Date

Invoice Number: 056.02.02 Invoice Period: 4/26/2019 - 05/31/19
 Client Project #: 0



SCHEDULE A

Hourly Professional Services Task Details - This Period

Added Hourly Tasks: Revised Emergency Repair Design Plans

Description	Status	Service	Hours	x	Rate	=	This Period
Design	*	Sr. Project Engineer	20.00		\$180.00		\$3,600.00
Design	*	EITs	77.00		\$78.00		\$6,006.00
Design	*	Sr. CADD Tech	64.50		\$93.00		\$5,998.50
Subtotal - Added Hourly Task - Design			161.50				\$15,604.50

Original Not To Exceed Task: Task 1 - Temporary Support

*Previously Submitted 4/25/19

Subtotal - Task 1 **\$0.00**

Original Not To Exceed Task: Task 2 - Inspection | Certification of Temporary Support

Description	Status	Service	Hours	x	Rate	=	This Period
Task 2	*	Sr. Project Engineer	8.00		\$180.00		\$1,440.00
Task 2		Sr. Inspector	29.00		\$93.00		\$2,697.00
*See PSR			37.00				

Subtotal - Task 2 **\$4,137.00**

Original Not To Exceed Task: Task 3 - Permanent Concrete Bent

Description	Status	Service	Hours	x	Rate	=	This Period
Task 3	*	Sr. Project Engineer	4.00		\$180.00		\$720.00
Task 3	*	EITs	39.00		\$78.00		\$3,042.00
Task 3	*	Sr. CADD Tech	13.50		\$93.00		\$1,255.50
*See PSR			56.50				

Subtotal - Task 3 **\$5,017.50**

Original Not To Exceed Task: Task 4 - Post Design - Not Started

Description	Status	Service	Hours	x	Rate	=	This Period
Subtotal - Task 4 \$0.00							

Original Not To Exceed Task: Task 5 - Inspection | Certification of Permanent Concrete Bent

Description	Status	Service	Hours	x	Rate	=	This Period
Subtotal - Task 5 \$0.00							

Subtotal - Not to Exceed Tasks **\$9,154.50**

Total Added and Original Professional Services This Period **\$24,759.00**

Invoice Number: 056.02.02
Client Project #: 0

Invoice Period
4/26/2019 - 05/31/19



SCHEDULE B

Project Costs - Site Visits

<u>Description</u>	<u>Class</u>	<u>Days/Miles</u>	<u>Rate</u>	<u>This Period</u>
Transportation - Mileage		600.00	\$0.445	\$267.00
Transportation - Ferry		1.00	\$184.00	\$184.00
Transportation - Air				\$0.00
Transportation - Misc. (Rental Car, Parking, Tolls)		1.00	\$225.90	\$225.90
Lodging		3.00	\$150.00	\$450.00
Meals Per Diem		5.00	\$36.00	\$180.00
Total Costs This Period				\$1,306.90
Total This Period				\$26,065.90