C

FORT MONROE
Where Freedom Lives

December 15, 2015

Virginia Marine Resources Commission
RFAB Grant Program
2600 Washington Avenue, Third Floor
Newport News, VA 23607

Re: Virginia Saltwater Recreational Fishing Development Fund

Dear Mr. O'Reilly,

The Fort Monroe Authority is submitting with this cover letter an application for grant funding to assist with the repair and expansion of the Finger Pier at Fort Monroe. The Finger Pier was previously a very desirable fishing spot before Fort Monroe was de-commissioned as an active Army installation in September 2011. When the property reverted to the Commonwealth of Virginia in 2013 the Authority was interested in re-opening the pier in conjunction with the Hampton Parks and Recreation Department. Hampton representatives performed an informal inspection and determined the pier was unsafe for use by the public. The Authority engaged the engineering firm Stroud Pence to perform a thorough inspection of the pier structure. The inspection report (a copy is attached with the application) confirmed that repairs needed to be made to the structure of the pier. Since repairs to the pier are required the Authority desires to widen the pier and add a T-head to make the pier safer and more functional as a fishing pier. With the support of the VMRC grant program the Authority expects this pier can once again become a prime fishing spot for saltwater fishermen in Virginia due to its unique proximity to the shipping channel.

Respectfully submitted,

John K. Hutcheson
Deputy Executive Director
Fort Monroe Authority

VIRGINIA SALTWATER RECREATIONAL FISHING DEVELOPMENT FUND
SUMMARY PROJECT APPLICATION

Please complete all fields. This page should be used as a coversheet for a detailed application.

NAME AND ADDRESS OF APPLICANT:
Fort Monroe Authority
20 Ingalls Road
Fort Monroe, Virginia 23651

PROJECT LEADER (name, phone, email):
Glenn Oder
Executive Director
757.637.7778
goder@fmauthority.com

DESCRIPTIVE TITLE OF EVENT:
Finger Pier Renovations

PROJECT LOCATION:
Fort Monroe Authority
20 Ingalls Road
Fort Monroe, VA 23651

BRIEF PROJECT SUMMARY: (include a detailed description of activity as an attachment)
The Finger Pier is located off of southern end of Gulick Drive and extends out into the Chesapeake Bay (see attached map). The Fort Monroe Authority (FMA) requests funding from the Recreational Fishing and Advisory Board (RFAB) of the Virginia Marine Resources Commission (VMRC) for the renovation and expansion of this pier which will provide a publically accessible facility for its saltwater fishing residents and visitors. The FMA specifically requests funding to cover the cost for the design and renovation of the existing pier, addition of a Tee head, access walkway and parking. The pier is currently inaccessible due to structural deficiencies outlined in the attached structural inspection report, and is owned by the Commonwealth of Virginia but operated and maintained by the FMA.

EXPECTED BENEFITS: (Describe how your project directly benefits the average Virginia recreational angler)
The Finger Pier will serve as a publicly accessible fishing location to the Chesapeake Bay providing greater saltwater recreational fishing opportunities for the FMA's residents and visitors. Access to the Chesapeake Bay will play an important role in the local economy through additional tourism revenue which will result in additional saltwater fishing licenses purchased annually. The renovation and expansion of the Finger Pier will enhance the use of the existing fishing opportunities and adjacent public facilities.

SUMMARY COSTS: (Please attach a detailed budget including all sources of recipient funding)

SUMMARY COSTS

Requested VMRC Funding:	**$ 240,675**
Recipient Funding:	**$ 159,960**
Total Costs:	**$ 400,635**

***This form alone does not constitute a complete application, see application instructions or contact Alicia Nelson at 757-247-8155 or alicia.nelson@mrc.virginia.gov**

DETAILED DESCRIPTION OF ACTIVITY

The Fort Monroe Authority is currently working on a Waterfront Master Plan which consists of improving and developing areas along its seven mile waterfront for public access and amenities. A primary goal of this plan is to provide recreational opportunities for residents and visitors enjoying the property.

OVERALL WATERFRONT PARK PLAN

FORT MONROE WATERFRONT PARK

FORT MONROE FOUNDATION Fort Monroe, Virginia

WPL SITE DESIGN | KIMLEY-HORN & ASSOCIATES | Q-DESIGN | OCULUS

OCTOBER 01, 2015
214-0156

75 0 150 300 FT

***This form alone does not constitute a complete application, see application instructions or contact Alicia Nelson at 757-247-8155 or alicia.nelson@mrc.virginia.gov**

The 102’ Finger Pier is located on Fort Monroe East of the North Island of the Hampton Roads Bridge Tunnel in Hampton, Virginia. The pier is comprised of twelve (12) bents containing two (2) timber piles per bent. The pier access is located on the southern most end of Gulick Drive. This pier offers unmatched access to desirable saltwater fishing in the Chesapeake Bay and historic views of the channel and adjacent fort.

A structural investigation by Stroud Pence completed in July 2014 found that the majority of the pier was in poor condition and requiring replacement of many of the structural components. (See attached report)

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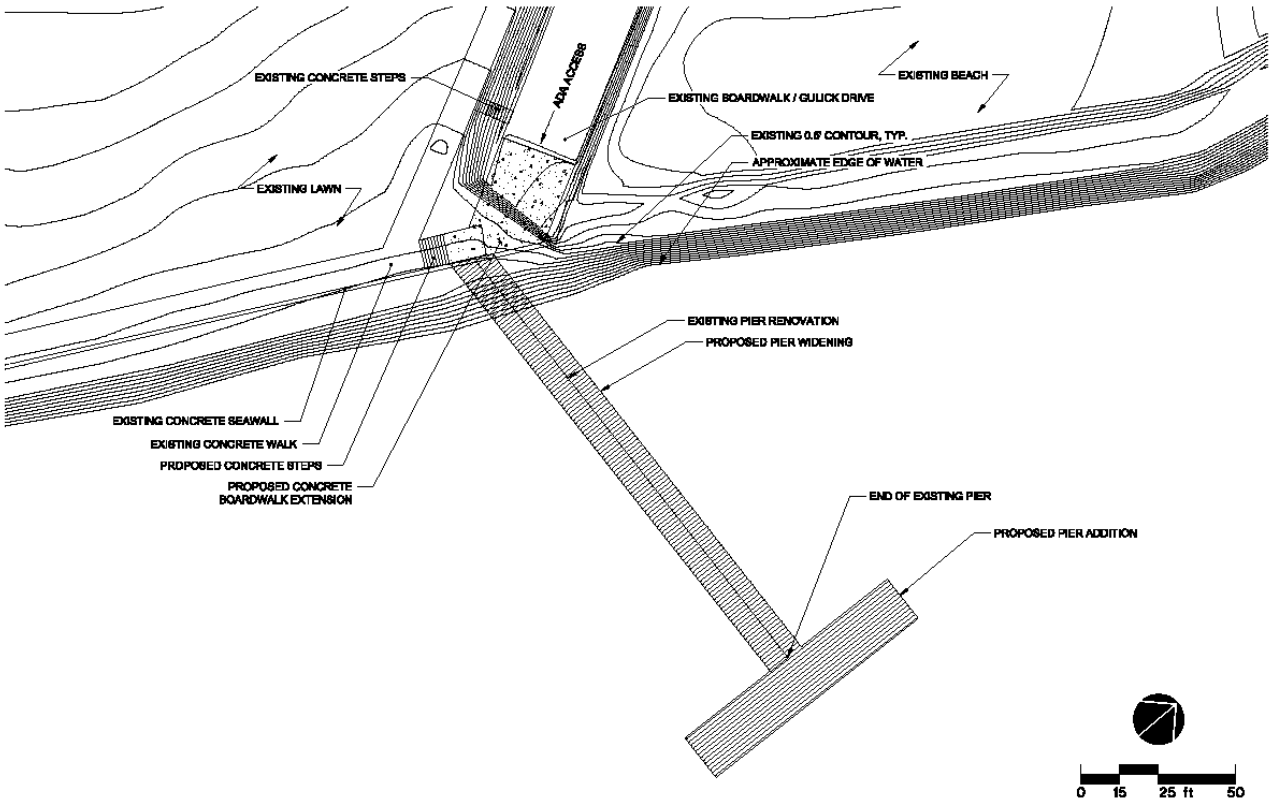
Currently the population of Fort Monroe and adjacent City of Hampton 136,876 (2014 Census Bureau Data). Fort Monroe has a growing population and tourism industry and is a part of the National Park System www.nps.gov/fomr/index.htm. Out of this population there are currently 9,010 saltwater fishing license holders. (Complete license holder information for FY 15 are included below) It is anticipated the primary users of this pier will be local to these areas.

This project will consist of engineering design and construction of the following components:

- Structural repairs and expansion (add T-Head and widen pier) of the existing Finger Pier
  - 50' pile lengths and Class B piles
  - Barge/crane mobilization and all work to be performed from water
  - Widen pier by 6 feet on one side for additional fishing opportunities
  - Construct 40'x12 T-Head on end of pier for additional fishing opportunities
- Extending Gulick Drive for ADA accessibility
- Access walkway and steps

The Commonwealth of Virginia through the Fort Monroe Authority would own, operate and maintain the pier and facilities.



Proposed Schedule

May 2016 – Award of RFAB Grant
May 2016 - July 2016 – Design and permitting of pier facility
August 2016 – Advertise for Construction
September 2016 – December 2016 – Construction of pier facility
January 2017 – Open for public use

DETAILED BUDGET

Finger Pier Renovation Cost Estimate				
Item	**Quantity**	**Unit**	**Cost**	**Total**
Construction Costs				
Extend Gulick Drive	125	SY	$ 400.00	$ 50,000
Concrete Walkways & Steps	250	SF	$ 25.00	$ 6,250
Site Lighting	1	LS	$5,500	$ 5,500

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Pier Renovation/Expansion	1	LS	$ 210,000	$ 210,000
Construction Administration	1	LS	$ 3,500	$ 3,500
	Construction Cost Total			**$ 275,250**
Design Costs				
Structural Inspection/Report for Pier	1	LS	$ 5,960	$ 5,960
Waterfront Park Plan	1	LS	$ 73,775	$ 73,775
Site & Hydrographic Survey	1	LS	$ 11,500	$ 11,500
Permitting	1	LS	$ 6,500	$ 6,500
Engineering Design	1	LS	$ 30,650	$ 27,650
	Design Cost Total			**$ 125,385**
	Total			**$ 400,635**

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SALWATER FISHING LICENSE DATA

(SOURCE – VMRC & DGIF)

License	650 City of Hampton	700 City of Newport News	GRAND TOTAL
611 - Resident Individual Saltwater Fishing	2,188	3,199	
612 - Non-Resident Individual Saltwater Fishing	10	17	
613 - Resident 10-Day Saltwater Fishing	53	81	
614 - Non-Resident 10-Day Saltwater Fishing	1	7	
615 - Resident Saltwater Boat Sport Fishing	635	517	
616 - Non-Resident Saltwater Boat Sport Fishing			
617 - Saltwater Boat Sport Fishing (Transfer)	3	1	
619 - Saltwater Boat Sport Fishing (Duplicate)			
651 - Saltwater Recreational Use Fish Cast Net	4	9	
652 - Saltwater Recreational Use Fish Dip Net		6	
653 - Saltwater Recreational Use Five Crab Pots	12	6	
654 - Saltwater Recreational Use Crab Trotline		4	
656 - Saltwater Recreational Use 300 Ft Gill Net	11	7	
657 - Saltwater Recreational Use Two Eel Pots			
701 - Resident State Fresh/Saltwater Fishing	725	1,484	
702 - Non-Resident State Fresh/Saltwater Fishing	1		
703 - Resident 5-Day Fresh/Saltwater Fishing		1	
704 - Non-Resident 5-Day Fresh/Saltwater Fishing			
715 - Resident Tidal Boat Sport Fishing	14	14	
716 - Non-Resident Tidal Boat Sport Fishing			
Total	3,657	5,353	**9,010**

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Stroud Pence Structural Engineers

Underwater And Topside Pier Investigation

Fort Monroe

Hampton, Virginia

July 3, 2014

CROFTON
Diving Corporation 16 Harper Ave - Portsmouth, VA 23707 (757) 397-1131 ph or (757) 397-8693 fax
Since 1949

ROFTON
Diving Corporation
16 Harper Avenue•P.O. Box 7756•Portsmouth, Virginia 23707•757-397-1131 (24 hours)•Fax 757-397-8693

July 3, 2014

Stroud Pence Structural Engineers
5032 Rouse Drive, Suite 200
Virginia Beach, VA 23462

Attn: John Hancock, Project Manager

Subject: Underwater and Topside Pier Investigation - Fort Monroe

Topic: Inspection Report

Dear Mr. Hancock,

Between June 5 and June 6, 2014, Crofton Diving Corporation performed an underwater and topside investigation of the 102' Pier located on the Southeast shore of Fort Monroe in Hampton, Virginia. We are pleased to provide the following underwater and topside inspection report. The purpose of this report is to provide information on the overall condition of the pier structure and structural components.

We appreciate the opportunity to work with you and the Stroud Pence Structural Engineers team on this and all future projects. I hope that this information meets with your approval and should you have any questions or concerns please feel free to contact me directly.

Regards,

Dave Mrowiec
Project Engineer
Crofton Diving Corporation
16 Harper Avenue
Portsmouth, VA 23707

Project Description:

- The 102’ Pier is located on Fort Monroe East of the North Island of the Hampton Roads Bridge Tunnel in Hampton, Virginia. The pier is comprised of twelve (12) bents containing two (2) timber piles per bent. The pier access is located on the southern most end of Gulick Drive.
- Each bent is comprised of two (2) 10”diameter piles, diagonal cross bracing, pile caps and horizontal cross bracing at the waterline. The 12 bent pier supports the pier decking and handrails.
- The inspection included the investigation of all topside and substructure components. These components included all timber piles, timber cross bracing, pile caps, bottom cross braces, stringers, deck boards and hand rails. The diver inspected all piles from the waterline to the mud-line and checked for scour around the pier structure piles.
- The purpose of this inspection is to determine the current condition of the piles and all structural elements of the pier.

Location Planning and Set-Up:

- A two (2) man inspection crew was assigned to the topside investigation work which included:
    - Steve Cunningham - ADCI certified commercial diving supervisor.
    - Nickolas Jordan - Engineer in Training (EIT)
- A three (3) man inspection dive team was assigned to the underwater investigation which included:
    - Steve Cunningham - ADCI certified commercial diving supervisor.
    - Robert Mercer - ADCI certified and NBIS/NHI Qualified commercial diver and underwater inspector.
    - Channing Connelly - ADCI certified commercial diver.

Location Planning and Set-Up (Continued):

- The topside inspection crew mobilized from the Crofton facility to the pier investigation location at Fort Monroe in Hampton, Virginia on June 5, 2014.
- The dive crew mobilized gear from Scotts Creek in Portsmouth, Virginia and traveled by truck to Fort Monroe where the crew set up and launched the survey boat at Old Point Comfort Marina. The crew navigated from the marina to the pier. The underwater inspection work took place on June 6, 2014.
- Dive operations were conducted in accordance with OSHA regulations and in full compliance with the Association of Diving Contractors International (ADCI) consensus standards. Recreational diver training is not compliant with the above reference regulations.
- The Inspection was completed on June 6, 2014. The crew returned to marina and secured the boat and gear and demobilized to the Crofton Facility at Scott's Creek in Portsmouth, Virginia.

Project Methodology:

- The three (3) man crew led by Diving Supervisor, Steve Cunningham and ADCI commercially certified divers, Channing Connelly and Robert Mercer conducted an underwater inspection in accordance with the American Society of Civil Engineers (ASCE) Underwater Investigation Standard Practice Manual.
- The crew began the work by assembling all equipment necessary to perform the investigation aboard the Tech I Survey Vessel.
- All timber support piles, structural timbers and decking were inventoried prior to the investigation. The pier was inventoried from South to North and West to East. Each structural element was labeled accordingly. A drawing illustrating the inventoried elements can be found in Appendix A of this report.
- For the purpose of inventory the structure's orientation of NNW to SSE was designated North to South with the head of the pier being South and all associated piles per bent were designated as West to East.

Project Methodology (Continued):

- The inspection began on the North end of pier at the sea wall and worked toward the pier head by measuring all structural components of the pier. The crew then performed a top-side inspection of the handrails and deck boards.
- All deck boards and hand rails were visually inspected for notable deficiencies such as major cracking, section loss, dry rot and insect damage. Non Destructive Testing (NDT) inspection methods were conducted on boards that were determined to be deficient. These methods included sounding the timber elements with a sounding hammer, where practical, and utilizing a wood pick to collect pick penetration measurements.
- Following the topside investigation, the underside and subaqueous pier structure elements were inspected. These structural elements included 10" timber piles, pile caps, stringer boards, and cross bracing. The investigation of the lower cross bracing timbers were performed during slack low tide. This allowed for the diver to visually inspect all elements thoroughly.
- The diver began the underwater investigation by performing a Level I inspection of all underwater elements. This involved the diver performing a tactile inspection by passing within arms reach of all elements being inspected. In addition, a visual inspection of all above water elements was conducted. This included all timber pile cross braces, hardware, timber decking, and all steel hardware components.
- As directed by Crofton's Project Engineer, a Level II inspection was conducted by the diver. This involved the diver cleaning the marine growth and fouling from 100% of all the underwater elements. These elements were cleaned in 1' high bands at the water line, mid water line, and mud line. Once the elements were cleaned of marine growth and fouling a close visual inspection was conducted.
- Finally, a Level III investigation was conducted on the pier structure. This involved taking Non-Destructive Test (NDT) readings at 100% of the locations cleaned during the Level II inspection.
    - The Level III investigation method consisted of penetration and sounding readings using a wood pick and sounding hammer. This method was used to determine the surface penetration of the pile and absence of material in the center of the pile.

Equipment:

- Crew Truck
- Tech I Dive Boat
- Shallow Air Dive Package with Constant 2-way Communication
- Hand Tools Including: Sounding hammer, hand pick, Ruler, Camera

Findings:

Topside

- There were (6) deck boards with soft wood which exhibited 1/2" pick penetration. Boards were easy to flex when walked on. These boards were noted to be in Poor condition. All other deck boards appeared to be in Good condition. Please see Appendix A for an approximate location of the boards that need to be replaced (Please See Photo #1, #2, and #3).
- The overall condition for the hand rail structure was noted to be in Poor condition. The majority of the hand rail and hand rail post appeared to be in Good condition, except for the middle 2" X 6" board on the East side handrail between the #11 and #13 handrail post. This board was found to be significantly splintered and in Poor condition defining the handrail structure as being rated in Poor condition (Please See Photo #4). The replacement of this board rated as poor would allow for the handrail structure to be rated in Good condition.
- Topside hardware appeared to be in Good condition with recently installed fastening screws (Please Photo #5).

Underside of Decking to Mudline

- Underside of decking other than the six (6) boards as described previously appear to be in Good condition.
- Pile caps appeared to be in Good condition.

Findings (Continued):

Underside of Decking to Mudline (Continued)

- At waterline area, all components are in Poor condition. At the waterline approximately 80% of the diagonal cross brace boards are in Failing condition with minimal structural support contributed by the lower bolting hardware (Please See Photo #6). The lower horizontal cross brace boards are in Poor condition with significant splitting and section loss. The bottom of horizontal cross brace boards were found to have an arch cut on the bottom side (Please See Photo #7). It was not determined what the purpose of this arch is for.
- One diagonal cross brace on the channelward side of Bent #4 was found to be missing (Please See Photo #8).
- Approximately 70% of 1" diameter fastening hardware at waterline was found to be in Poor condition.
- The piles were found to be 10" diameter timber piles. The first two (2) bents #11 & #12 inshore were found to be recently installed pressure treated timber piles. The remaining ten (10) bents were found to be comprised of creosote timber piles with 80% of the creosote missing, exposing timber piles to elements. All piles above and below waterline were found to be in satisfactory condition with the exception of four (4) piles located at bents #10, #9 and #15.
- Due to the significant section loss in Bent #10 (East and West), the piles are rated Very Poor condition. Pile Bent #10 contained the most significant deterioration with the East pile exhibiting approximately 50% deterioration and the West pile exhibiting approximately 30% deterioration at the waterline (Please See Photo #9).Piles at Bents #9 and #5 contained piles that were determined to be in poor condition with 20% deterioration at the waterline.
- Hammer soundings were taken at Bent #10 (East and West), Bent #9 (East), Bent #5 (West). Returned soundings that were not solid, therefore it was determined that these piles were significantly deteriorated. These readings were taken on the piles from the underside of the decking to the waterline.

Findings (Continued):

Underside of Decking to Mudline (Continued)

- Minimal pick penetration depths were recorded below the waterline and no readings exceeded 1/8" penetration depths. There were no positive sounding hammer readings for absence of material on the interior of any piles below the waterline.
- There was no scouring observed around any of the piles. The diver surveyed the area out 10' to 15' on each side of pier no change in elevation or scouring was noted.

Pipeline

- There was a 12" steel pipeline found to run between the piles and the lay length was noted to be oriented parallel to the pier. The outfall for the pipe was measured to extend 3' past the pier head. There was no discharge coming from the pipe at the time of the inspection.
- The top of the pipe was exposed at Bent #4, half (1/2) exposed at Bent #6 and fully exposed at Bent #12**.** Please see Appendix A for a detailed drawing of the pipe elevations in correlation to the pier structure and bottom contour.

Stairway and Access Platform

- The 2" X 4" deck joists supports on the North side of the access platform were found to be in Poor condition. The deck joists supports were found hanging from beneath the deck (Please See Photo #10).
- No other deficiencies were noted

Please see Appendix B for a comprehensive set of data pertaining to Bents #1 - #12 of the pier structure investigation.

Recommendations For Repair:

Topside

- Replace the six (6) deck boards noted in the findings section and illustrated in the drawings with a new 2” X 8” pressure treated lumber with CA-C 0.06 pressure treatment concentrations.
- Replace the middle handrail board between handrail post #11 & #13 on the East side with a new 2” X 6” pressure treated board with CA-C 0.06 pressure treatment.

Underside of Decking to Mudline

- Replace the missing 3” X 10” diagonal cross brace located on the channelward side of Bent #4 with new 3” X 10” pressure treated board with 2.5lb CCA.

Underside of Decking to Mudline (Continued)

- Replace all 1”diameter hardware located at the waterline with galvanized hardware.
- Replace deteriorated horizontal 3” X 10” horizontal cross braces located at the waterline with pressure treated board with 2.5lb CCA treatment concentrations.
- Replace deteriorated 3” X 10” diagonal cross braces due to significant section loss and rot found at the waterline with pressure treated board with 2.5lb CCA treatment concentrations.
- Replace Bent #10 piles (East and West) with new 10” diameter Pressure treated timber piles containing 2.5lb CCA. Due to the 50% and 30% section loss in both piles of Bent #10 it is highly recommended that these piles are replaced. Section loss to this magnitude significantly decreases the structural capacity of the pile in both the axially and laterally loaded configurations.
- Replace piles at Bent #9 (East) and #5 (West) with new 10” diameter pressure treated timber piles containing 2.5lb CCA. The piles at these bents exhibit 20% section loss and it is recommended to replace these piles to increase the overall capacity of the structure and to bring all piles up to the rating of satisfactory or better.

Recommendations For Repair (Continued):

Pipeline

- No recommendations

Stairway and Access Platform

- Replace deficient deck joist supports with new 2” X 4” pressure treated lumber containing CA-C 0.06 pressure treatment concentration.

Photographs

Photo 1: 2nd deck board from pier head that needs to be replaced.

Photo 2: Deck board found at 3rd handrail post that needs to be replaced.

Photographs

Photo 3: Deck board found at 8th handrail post that needs to be replaced.

Photo 4: Middle guardrail board between handrail post #11 and #13 on East side of pier.

Photographs

Photo 5: Typical fasteners holding guardrail boards to handrail post.

Photo 6: Typical deteriorated diagonal cross brace found at Bent #10

Photographs

Photo 7: Typical arch cut into underside of horizontal cross brace at Bent #1 - Bent #3.

Photo 8: Missing diagonal cross brace found at Bent #4.

Photographs

Photo 9: View of East pile at Bent #10 exhibiting 50% section loss to the pile at the waterline.

Photo 10: Hanging deck joist stiffener found on stairway access at the North end of pier.

Index of Appendices

Appendix A - Drawings

Appendix B - Inspection Data

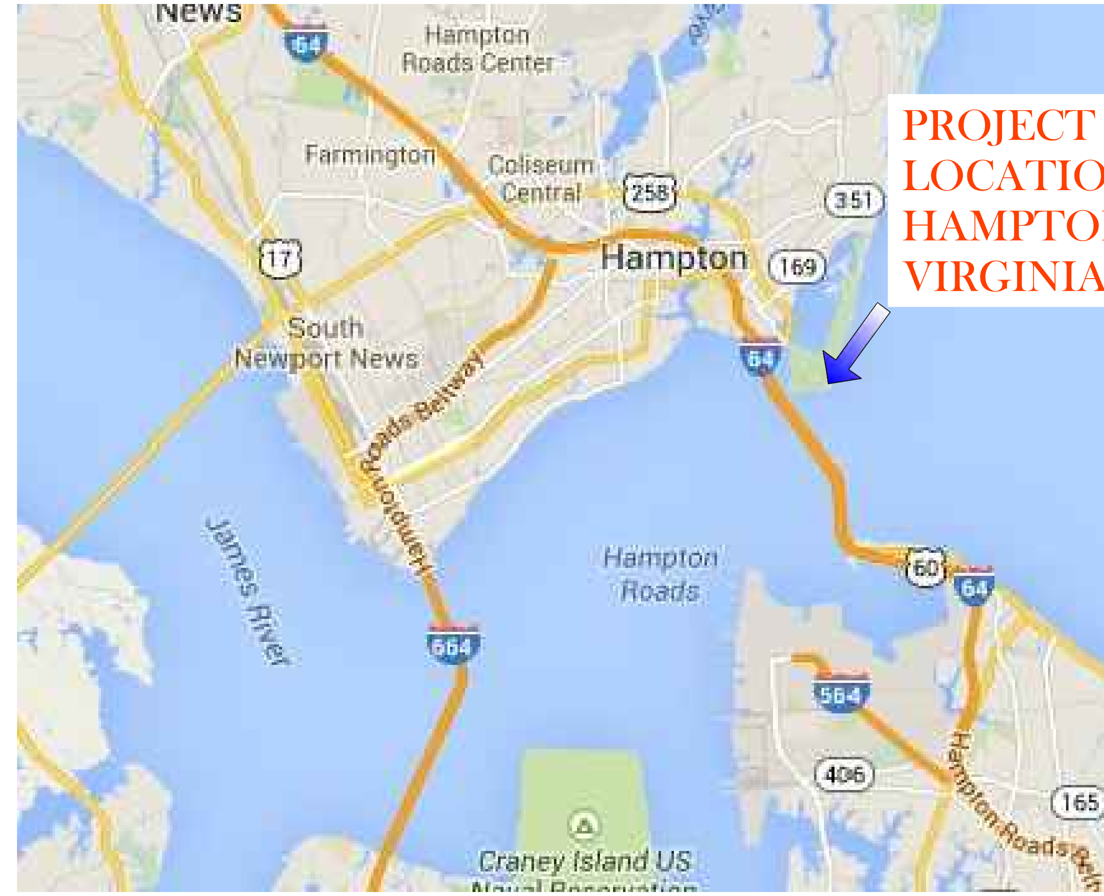
Appendix A

E D C B A

5 4 3 2 1

N

AERIAL MAP
SCALE: NONE



N

LOCATION MAP
SCALE: NONE

STROUD AND PENCE STRUCTURAL ENGINEERS

INSPECTION OF PIER LOCATED AT FORT MONROE

HAMPTON, Virginia.

INDEX TO DRAWINGS

SHEET NO.	DISCIPLINE NO.	TITLE
1	G001	COVER SHEET
2	C101	PROJECT PLAN / PROFILE VIEW
3	S101	SECTIONS

REVISIONS
REVISION NOTES:
ZONE:
REV:

DESIGNED BY: N.JORDAN
DRAWN BY: T.M.HARRIS
REVIEW BY: N.JORDAN
APPROVED BY:
SIGN & DATE:

CROFTON Industries Since 1949
Construction - Diving - Technical Services
16 Harper Avenue
Portsmouth, Virginia 23707
Tele (757) 397-1131
Fax (757) 397-8693
www.croftondiving.com

CUSTOMER:
STROUD AND PENCE STRUCTURAL ENGINEERS

PROJECT TITLE:
INSPECTION OF PIER LOCATED AT FORT MONROE

COVER SHEET

JOB NO: 14-6560

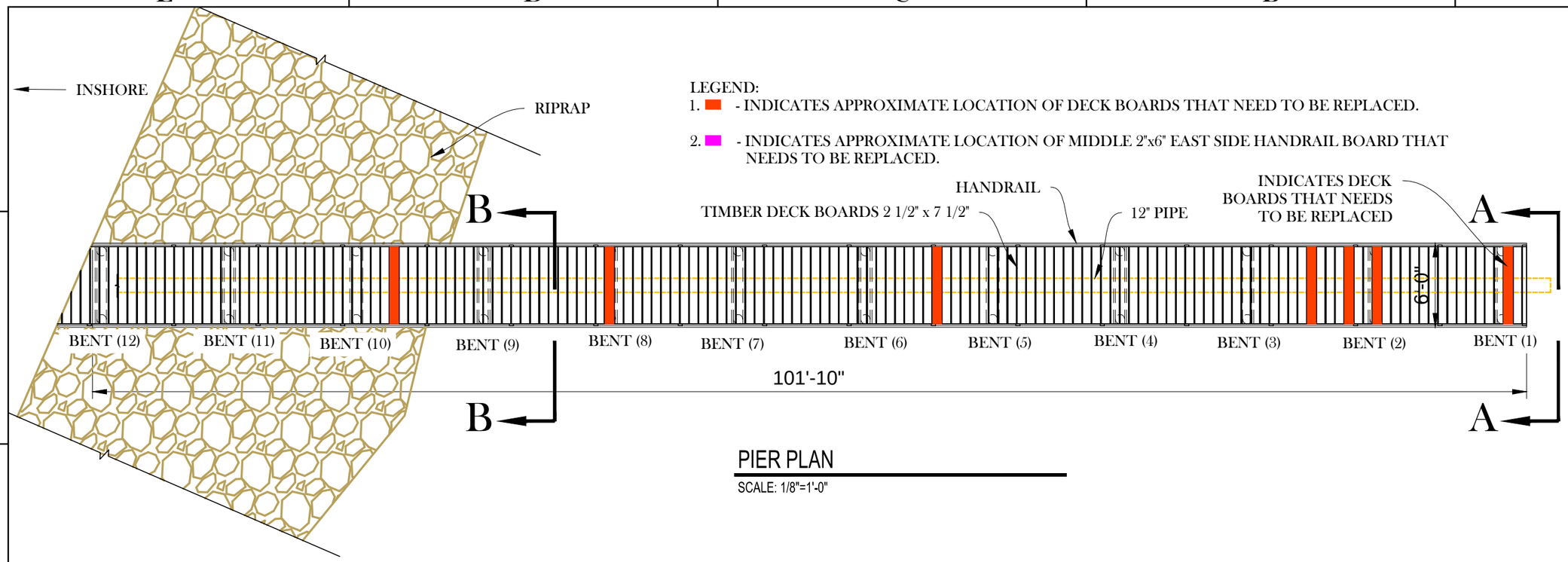
CONTRACT NO: N/A

SCALE: NONE

REV: | DWG SIZE: B | DATE: 06/25/14

SHEET: G001

E D C B A

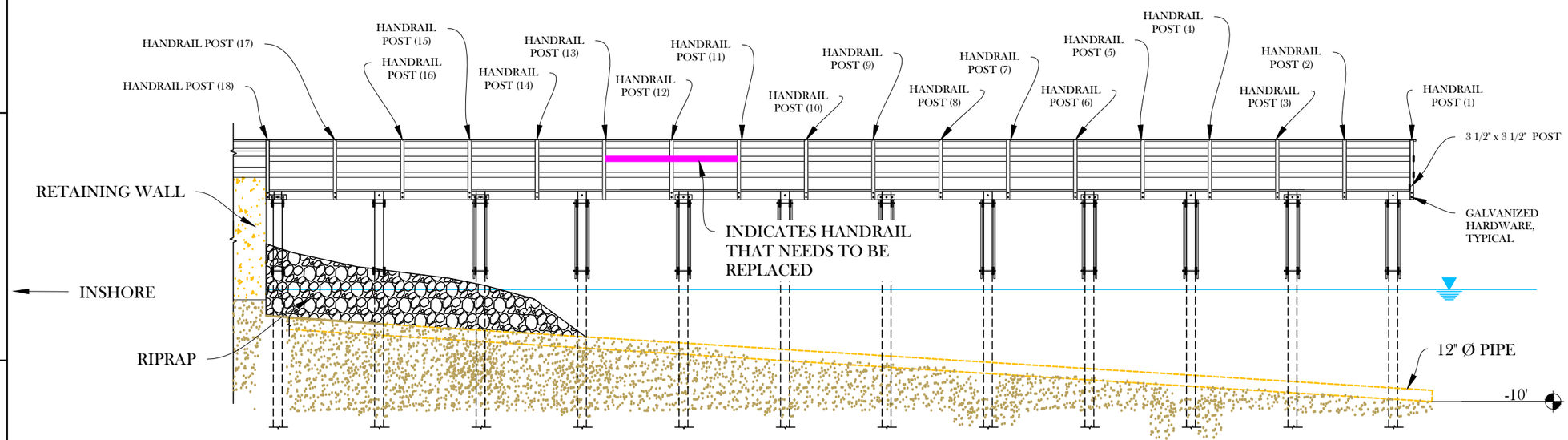


LEGEND:

1. ■ - INDICATES APPROXIMATE LOCATION OF DECK BOARDS THAT NEED TO BE REPLACED.
2. ■ - INDICATES APPROXIMATE LOCATION OF MIDDLE 2"x6" EAST SIDE HANDRAIL BOARD THAT NEEDS TO BE REPLACED.

PIER PLAN

SCALE: 1/8"=1'-0"



PROFILE VIEWING EAST

SCALE: 3/32"=1'-0"

REVISIONS

REV:	ZONE:	REVISION NOTES:
-	-	1

INITIAL ISSUE 6/25/13

DESIGNED BY: N.JORDAN
DRAWN BY: T.M.HARRIS
REVIEW BY: N.JORDAN
APPROVED BY:
SIGN & DATE:

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CUSTOMER:
STROUD AND PENCE STRUCTURAL ENGINEERS

PROJECT TITLE:
INSPECTION OF PIER LOCATED AT FORT MONROE

PLAN / PROFILE

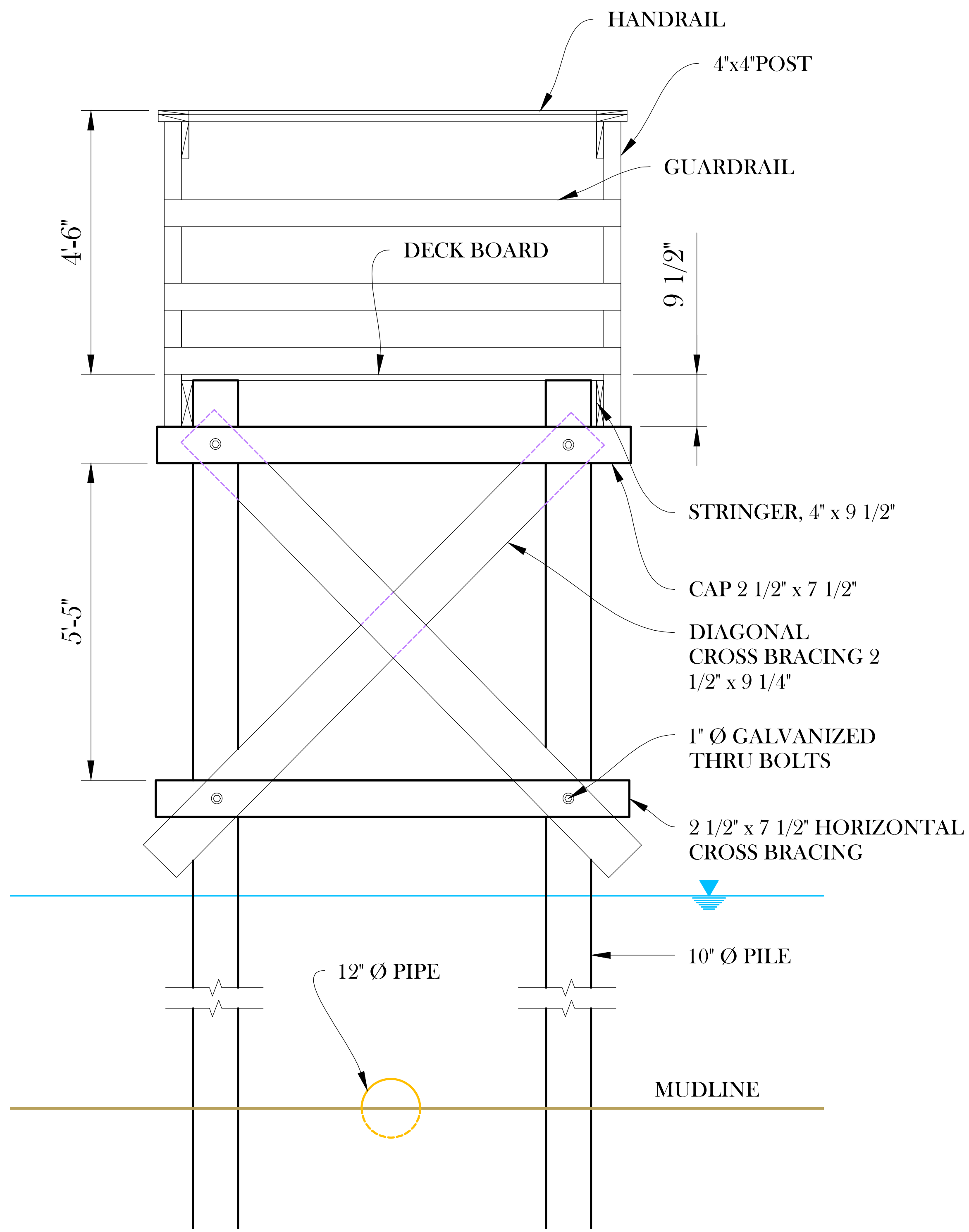
JOB NO: 14-6560

CONTRACT NO: N/A

SCALE: AS NOTED

REV: | DWG SIZE: B | DATE: 06/25/14

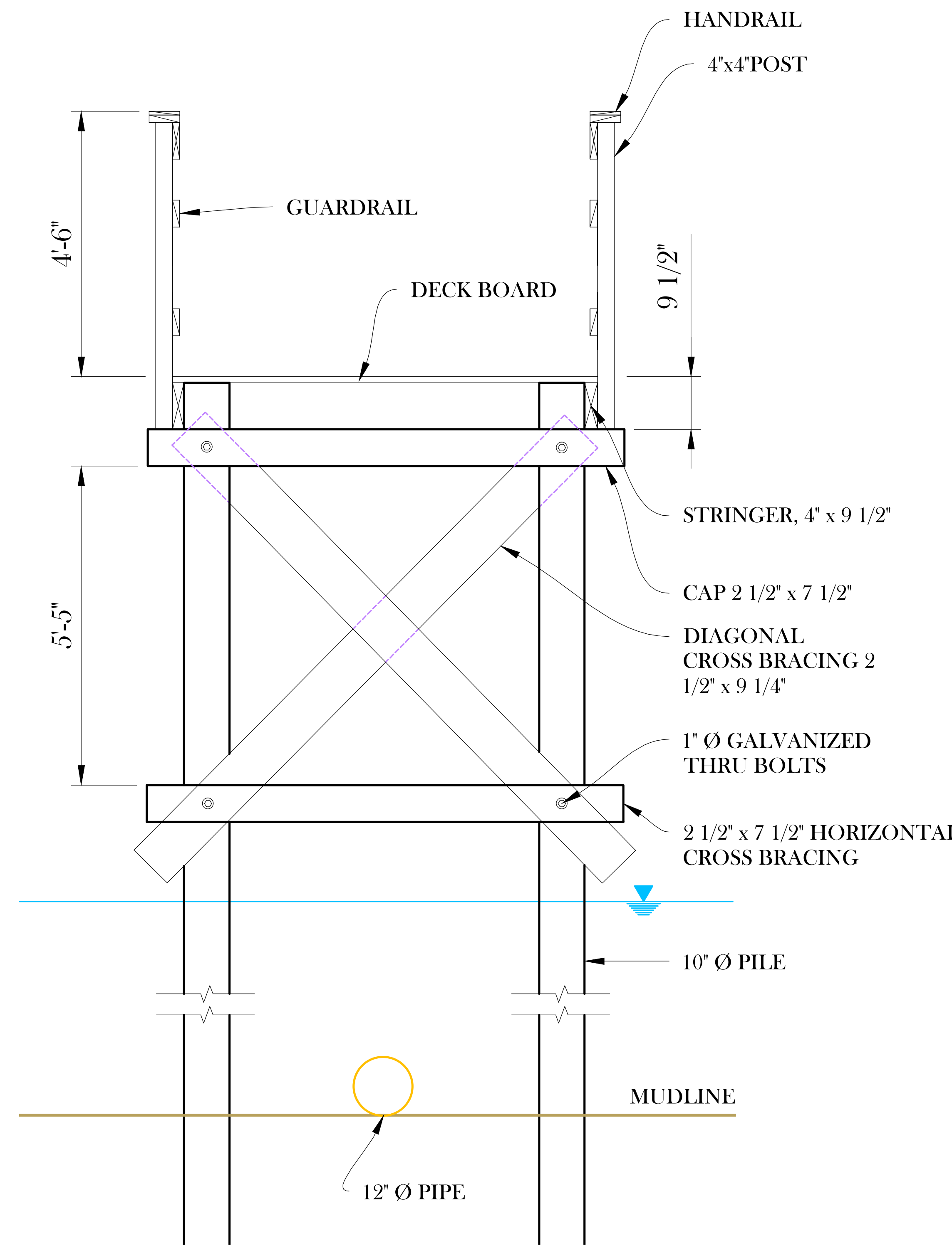
SHEET: C101



SECTION A-A (SEE SHEET C101)

SCALE: 3/8"=1'-0"

* 12" DIA. PIPE IS 50% EXPOSED AT BENT 7



TYPICAL SECTION B-B (SEE SHEET C101)

SCALE: 3/8"=1'-0"

* 12" DIA. PIPE IS 100% EXPOSED AT END OF PIER BENT 1

REVISIONS

REVISION NOTES:

DESIGNED BY: N.JORDAN
DRAWN BY: T.M.HARRIS
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PROJECT TITLE:
INSPECTION OF PIER LOCATED AT FORT MONROE

SECTIONS

JOB NO: 14-6560

CONTRACT NO: N/A

SCALE: AS NOTED

REV:

DWG SIZE: B

DATE: 06/25/14

SHEET: S101

Appendix B

Pier Inspection Field Data

Bent #	East Pile	Pick Penetration (in)	West Pile	Pick Penetration (in)	Diagonal Cross Brace (Inshore)	Deterioration (%)	Diagonal Cross Brace (Channel Ward)	Deterioration (%)	Pile Cap	Horizontal Cross Tie (Lower)	Deterioration (%)	Upper Hardware	Lower Hardware	Depth (ft)	Marine Growth (%)	Bottom Composition
1	Satisfactory	1/8	Satisfactory	1/8	Satisfactory	10	Failing	50	Good	Fair	30	Good	Poor	10	100	Gravel
2	Satisfactory	1/8	Satisfactory	1/8	Failing	40	Good	0	Good	Satisfactory	10	Fair	Good	10	100	Sand/Gravel
3	Satisfactory	1/4	Satisfactory	1/4	Failing	90	Failing	20	Good	Fair	20	Fair	Poor	9	100	Gravel
4	Satisfactory	1/8	Satisfactory	1/4	Satisfactory	10	Missing	100	Good	Fair	30	Fair	Poor	9	100	Gravel
5	Satisfactory	1/8	Poor	3/8	Satisfactory	10	Satisfactory	10	Good	Poor	40	Good	Poor	7	100	Gravel
6	Satisfactory	1/4	Satisfactory	1/4	Failing	20	Failing	20	Good	Fair	20	Good	Poor	7	100	Gravel
7	Satisfactory	1/8	Satisfactory	1/4	Failing	20	Failing	20	Good	Fair	30	Good	Fair	7	100	Sand
8	Satisfactory	1/4	Satisfactory	1/4	Failing	20	Failing	20	Good	Good	5	Fair	Fair	5.5	80	Sand/Gravel
9	Poor	1/2	Satisfactory	1/4	Failing	20	Failing	20	Good	Satisfactory	10	Fair	Poor	4	100	Rip Rap
10	Very Poor	3/8	Poor	3/8	Failing	40	Good	0	Good	Poor	50	Fair	Poor	3	None	Rip Rap
11	Satisfactory	N/A	Satisfactory	N/A	N/A	N/A	N/A	N/A	Good	N/A	N/A	Good	N/A	0	N/A	Rip Rap
12	Satisfactory	N/A	Satisfactory	N/A	N/A	N/A	N/A	N/A	Good	N/A	N/A	Good	N/A	0	N/A	Rip Rap